



DONALD L. WOLFE, Director

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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IN REPLY PLEASE

REFER TO FILE: **W-0**

December 12, 2006

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, CA 90012

Dear Supervisors:

**LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY
APPROVAL OF WATER SUPPLY ASSESSMENTS FOR TENTATIVE
TRACT NOS. 60610, 60620, 62758, AND 62759
SUPERVISORIAL DISTRICT 5
3 VOTES**

**IT IS RECOMMENDED THAT YOUR BOARD ACTING AS THE GOVERNING BODY
OF THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40,
ANTELOPE VALLEY:**

1. Approve the Water Supply Assessment (Assessment) for Tentative Tract Nos. 60610 and 60620 (Enclosure A) and the Assessment for Tentative Tract Nos. 62758 and 62759 (Enclosure B), in the City of Lancaster.
2. Authorize the Director of Public Works, or his designee, to sign the Notices of Determination (Enclosures C and D) and submit said notices and the Assessments to the City of Lancaster.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The purpose of these actions is to approve Assessments required by California Water Code §10910, et seq., showing that the Los Angeles County Waterworks District No. 40, Antelope Valley, has sufficient water supplies for the proposed developments during normal water years. The Assessments also show that the District has plans to provide sustainable water supplies during single-dry and multiple-dry water years.

Implementation of Strategic Plan Goals

These actions are consistent with the County Strategic Plan Goal of Service Excellence by ensuring a reliable supply of water for the District's customers.

FISCAL IMPACT/FINANCING

There will be no impact to the County's General Fund.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

California Water Code §10910, et seq., requires the District to prepare an Assessment for projects in the District's service area subject to the California Environmental Quality Act (CEQA) that involve residential development of more than 500 dwelling units. The Assessment must include a discussion with regard to whether the District's total projected water supplies available during normal, single-dry, and multiple-dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the District's existing and planned future water uses. Pursuant to California Water Code §10910(g)(1), your Board must approve the Assessment at a regular or special meeting.

Based on the District's Urban Water Management Plan adopted by your Board in November 22, 2005, the Assessments indicate that the District has the ability and plans to provide the needed water supply for these developments under all conditions. The District is currently working with several agencies to create a groundwater banking program and has circulated a Request for Proposal for a water bank to firm up the District's water supply during dry years.

The Honorable Board of Supervisors
December 12, 2006
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Tentative Tract Nos. 60610, 60620, 62758, and 62759 will involve residential subdivisions of more than 500 dwelling units and lie within the District's service area. Therefore, the District's staff at Public Works prepared the Assessments for the proposed projects in accordance with the requirements of California Water Code §10910, et seq.

ENVIRONMENTAL DOCUMENTATION

The proposed action is mandated of the District to be submitted to the City of Lancaster by California Water Code §10910(g)(1) and, therefore, does not constitute a discretionary approval by the District that would be subject to CEQA. Pursuant to California Water Code §10911(b), the City of Lancaster, as the land-use authority responsible for approving the subdivision maps for the tracts in question and the lead agency under CEQA for the proposed projects, is required to include the Assessments provided by the District in the environmental impact reports that the City is processing for the tracts.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

There will be no negative impact on current County services or projects during the performance of these actions.

CONCLUSION

Please return one adopted copy of this letter to Public Works, Waterworks and Sewer Maintenance Division.

Respectfully submitted,

DONALD L. WOLFE
Director of Public Works

DWP:ir
BDL2268

Enc. 4

cc: Chief Administrative Office
County Counsel

WATER SUPPLY ASSESSMENT

Tentative Tract Nos. 60610 and 60620
in the City of Lancaster

December 12, 2006

Prepared by:

Los Angeles County Waterworks District No. 40, Antelope Valley

INTRODUCTION

This report is a Water Supply Assessment (Assessment) prepared by Los Angeles County Waterworks District No. 40, Antelope Valley (District), at the request of the City of Lancaster for the proposed Tentative Tract Nos. 60610 and 60620 (Project). Pursuant to California Water Code §10910, et seq., the District has been identified as the public water system which may supply water to the Project. In connection with the City of Lancaster's environmental assessment of the Project and pursuant to the requirements of California Water Code §10910, et seq., the District was requested to prepare a Assessment to determine whether the District's projected supply will meet the demands for the Project, in addition to existing and future planned water uses in the District.

A California Water Code §10910, et seq., Assessment is required for any "project" that is subject to the California Environmental Quality Act (CEQA) and proposes residential development of more than 500 dwelling units. The Project is a qualifying project under this definition. No Assessment has been previously prepared for the Project that complies with the requirements of California Water Code §10910, et seq.

A. Project Description

The proposed Project is located in the area generally bounded by Avenue H, 100th Street West, Lancaster Boulevard, and 97th Street West in the City of Lancaster. Based on information provided, the Project includes the development of 820 single-family residential lots on approximately 219 acres. The Project also includes improvements to existing roadways and construction of several local roadways and cul-de-sacs throughout the Project site. The Project site is currently undeveloped with no water supply infrastructure in place. Upon completion, the total water demand for the Project is estimated to be approximately 984 acre-feet per year (af/yr).

B. Purpose of the Assessment

The purpose of this Assessment is to provide an analysis to the City of Lancaster of whether the District's water system has sufficient projected water supplies to meet the projected demands of the Project. Specifically, this Assessment evaluates whether the total projected water supply for normal, single-dry, and multiple-dry water years over the next 20 years will meet the projected water demand associated with the Project in addition to existing and future planned water uses. If the water supply is determined to be insufficient, the Assessment must describe the steps that will be taken to obtain an adequate supply. This Assessment is required by the California Water Code §10910, et seq., to be included in the Environmental Impact Report prepared for the Project pursuant to the CEQA.

C. Description of the District

The District is a public water agency that serves portions of the Cities of Lancaster and Palmdale and several small communities in the eastern portion of the Antelope Valley located in Los Angeles County. The District supplements local groundwater supplies with State Water Project (SWP) water from Northern California. SWP water is treated and delivered to the District by the Antelope Valley-East Kern Water Agency (AVEK).

D. Supporting Information

Information from the following documentation has been used in the preparation of this Assessment. The referenced documents are incorporated into this Assessment as if fully set forth herein. Most of these documents are available on the District's website (www.lacwaterworks.org) or can be reproduced by the District for a nominal fee.

- 2005 Integrated Urban Water Management Plan for the Antelope Valley, December 2005
- State Water Project Delivery Reliability Report, California Department of Water Resources, May 2006
- Antelope Valley Water Resource Study, Kennedy-Jenks Consultants, November 1995
- Lancaster Subbasin Aquifer Storage and Recovery Demonstration Project Final Report, Los Angeles County Department of Public Works, January 2000
- Planned Utilization of Water Resources in Antelope Valley, California Department of Water Resources, October 1980
- Report on existing and projected water demands and source of supply for the Antelope Valley, Los Angeles County Waterworks Districts, March 1991
- Final Facilities Planning Report, North Los Angeles County Recycled Water Project, Los Angeles County Waterworks Districts, March 2006

WATER SUPPLY ASSESSMENT

Based on the scope of the Project, the District has reviewed the 2005 Integrated Urban Water Management Plan for the Antelope Valley (IUWMP) and determined that the population growth associated with the Project is included in the projected population and water demand for the District in the IUWMP. The IUWMP projects a population growth within the District between 2005 and 2015 of 86,347 people (28,200 customers) and a corresponding increase in overall yearly water demand in the District of 32,200 acre-feet. Since the beginning of 2005, the District has committed to supply water to over 25,000 new customers representing a water demand of just over 30,300 af/yr. Table 1 below summarizes these customers and the addition of the customers associated with the Project.

Table 1

	Customers	Water Demand (af/yr)
New Customers Since 2005	5,300	6,360
Future customers with Will-Serve Letters	3,046	3,655
Future customers from approved developments	862	1,034
Customers in planned developments accounted for in the IUWMP	14,325	17,190
Customers with completed Water Supply Assessments	1,594	2,100
Customers associated with TTMs 060610 and 060620	820	984
Total	25,947¹	31,323¹

¹ Although it appears from these numbers that the District is adding customers at a faster pace than what was projected in the IUWMP, many of the planned developments associated with these numbers will not be completed for several more years.

The IUWMP identifies groundwater and imported SWP water as the two existing sources of water to supply the demand for the District. Table 2 below shows the District's water supply sources in acre-feet during the last five years.

Table 2

	2001	2002	2003	2004	2005
Groundwater	21,736	21,194	16,897	21,348	18,334
Imported Water	30,965	33,440	37,442	36,231	35,935
Total	52,701	54,634	54,339	57,579	54,269

A. Available Groundwater

The Antelope Valley Groundwater Basin (Basin) is the only local source of supply for the District and is comprised of two primary aquifers (commonly referred to as the deep aquifer and the principal aquifer). The excerpt from the State of California Department of Water Resources Bulletin 118 that describes the Basin is included as Attachment A.

Pumping of groundwater has significantly exceeded the natural recharge to the Basin. According to the United States Geologic Survey, the safe yield of the Basin is estimated to be between 31,200 af/yr and 59,100 af/yr. Although the State of California Department of Water Resources (DWR) has not identified the Basin as overdrafted or projected that the Basin will become overdrafted in its most current bulletin, DWR's Bulletin 118, the District is undertaking efforts to eliminate potential long-term overdraft conditions in the Basin.

The District currently operates 35 active groundwater wells in the Basin. Although the Basin is not currently adjudicated, the IUWMP provides a goal for the District to limit pumping to an average of 20,000 af/yr based on an expected groundwater basin management program that would bring extractions back in line with the perennial yield of the Basin. The District pumped between 17,000 and 22,000 af/yr from the Basin in each of the last five years. The District

also initiated a full-scale Aquifer Storage Recovery (ASR) project in 2005 to inject and store treated SWP water in the Basin for later use to supplement available water supplies. Since the initiation of this ASR project in 2005, the District has stored 1,542 acre-feet of SWP water in the Basin through the ASR project.

Through its rates paid to AVEK, the District has been contributing to the subsidy of the price of imported water for use by agriculture in-lieu of pumping groundwater. Said in-lieu subsidies are estimated by AVEK to have reduced groundwater extraction by agriculture from the Basin in excess of 400,000 acre-feet.

In 2004, the District filed an action to adjudicate the groundwater rights of the Basin, which is expected to institute a physical solution for groundwater management to prevent long-term overdraft conditions. The physical solution is expected to result in a management program that will include increases in imports of water from outside of the Basin, adoption of water conservation measures, and the increase in the use of recycled water.

B. Available Imported Surface Water

The District also utilizes imported SWP water purchased from AVEK. AVEK is a SWP contractor with a Table A amount of 141,400 acre-feet. The Water Service Agreement between the District and AVEK is included as Attachment B. The IUWMP projects that on average between 64,500 and 70,400 af/yr of imported water will be available to the District from AVEK between 2005 and 2030.

C. Available Supply During An Average/Normal Year

Table 3 shows the past water supply for the District during a normal year.

Table 3 – Historic Water Supply Sources

Water Supply Sources	1990	1995	2000	2005
Purchased from AVEK	21,232	21,692	34,655	35,935
Supplier produced groundwater	13,905	19,795	17,419	18,334
Total	35,137	41,486	52,074	54,269

As shown in the tables included in Attachment C, the existing supplies for the District during normal years are sufficient to meet projected increases in water demands through 2015. To assure the District receives a reliable supply of imported water each year, the District assesses a water supply reliability fee to all new developments that is used to construct or secure facilities to store available imported water during wet years for use in dry years. Beyond 2015, the District will utilize recycled water and other planned new water supplies to meet increasing demands. The following actions must be undertaken by the District and other Agencies to assure a reliable water supply during normal years.

Increased Treatment and Well Capacity

The current treatment plant capacity from the two AVEK water treatment plants that serve the District is 75-million-gallons per day (MGD). The District currently receives about 87 percent of the water produced by AVEK. However, during the hot summer months, the District receives, on average, 70 percent of the flow from AVEK's Quartz Hill Treatment Plant and all of the flow from AVEK's Eastside Treatment Plant representing a combined flow of 55 MGD. In addition, the District's wells can produce a total capacity of 38 MGD. During the summer, the daily demand in the District is roughly twice the average day demand in the District. Therefore, by 2015 the daily summer demand in the District will approach 160 MGD. In order to supply this quantity of water during the summer, the District plans to construct additional wells and the capacity of AVEK's treatment plants must be increased. To fund the construction of the new wells, the District assesses a groundwater supply fee to all new developments.

Recycled Water

In March 2006, the District, in cooperation with other agencies in the Antelope Valley, prepared a Facilities Planning Report for the North Los Angeles County Recycled Water Project. This Report identifies potential recycled water users and provides preliminary designs and cost estimates to construct a recycled water backbone distribution system in the Antelope Valley to convey treated wastewater from the Los Angeles County Sanitation Districts' treatment plants to customers. This Report is available on the District's website. Based on this Report, approximately 13,600 acre-feet of recycled water per year can be used by the District's existing and future customers. The District assesses a recycled water fee to all new developments that will fund the design and construction of this recycled water backbone distribution system.

Water Conservation/Reduced Irrigation Demand

The District also promotes conservation throughout its service area and estimates that by 2030, 10 percent of the overall demand in the District will be met through conservation efforts. The Project can include implementation of water conservation measures to reduce the overall demand to the District. In general, landscape irrigation can account for up to 70 percent of the water consumed at local residences. In order to reduce the water demand for this Project, specific measures could be included such as the use of xeriscaping, low water-use turf, or a synthetic grass substitute at every private residence to minimize or eliminate the

irrigation demand from this Project. In addition, weather-sensitive irrigation timers could be installed to assure all landscaping receives only the specific amount of water that it needs.

D. Available Supply During a Single-Dry Year

As shown in the tables included in Attachment C, a significant portion of the District's water supply during single-dry years will be met with water stored in groundwater banks. The District's water supply reliability fee assessed to all new developments will be used to construct these groundwater banks or secure storage space in existing facilities and purchase available water during wet years to store in these banks or the local Basin for use in dry years.

E. Available Supply During Multiple-Dry Years

As shown in the tables included in Attachment C, the IUWMP projects a water supply portfolio for the District during multiple-dry years that is similar to the available water supply during single-dry years including a combination of imported water, groundwater, recycled water, water stored in groundwater banks, and water stored as part of the District's ASR project.

CONCLUSION/PLANS FOR CONSTRUCTING NEW FACILITIES

As indicated in this Assessment, while the District's existing water supplies are sufficient to meet the demands associated with the Project, sufficient facilities do not yet exist to assure the reliability of these supplies. Specifically, a groundwater storage program must be developed and the capacity of AVEK's treatment plants must be increased in order to assure a reliable supply of imported and stored water to the District. In addition, a recycled water backbone distribution system must be designed and constructed to bring recycled water available from the Los Angeles County Sanitation Districts into the District's service area.

The District has estimated the cost to establish a groundwater bank sufficient to maximize its available imported water supply from AVEK will be \$68 million. To fund the design and construction of a bank, the District assesses a fee of \$1,500 per billing unit for each new development in the District. The District has committed to work with the Antelope Valley State Water Project Contractors Association in establishing a groundwater banking program in the Antelope Valley. The District intends to send its Request for Proposals (RFP) in early 2007 to secure up to an additional 63,500 acre-feet of water per year during dry water years through water banking programs. In addition to funding the design and construction of a groundwater bank, the appropriate CEQA documentation must be prepared. If a groundwater bank is constructed in the Antelope Valley, a Waste Discharge Permit will be required from the Lahontan Regional Water Quality Control Board, and additional permits from the State Department of Water Resources, local landowners, and the local jurisdictions must be acquired. The District is currently establishing short-term groundwater banking

agreements with parties that already operate or have access to existing groundwater banks until a permanent groundwater bank can be established in the Antelope Valley. The District anticipates a permanent groundwater bank will be constructed in phases in the Antelope Valley between 2007 and 2025 as the storage and extraction capacity requirements increase with demand in the District's service area.

The Facilities Planning Study for the North Los Angeles County Recycled Water Project estimated the cost to design and construct the backbone recycled water distribution system for the District would be \$120 million. To fund this project, the District assesses a fee of \$1,200 per billing unit for each new development in the District. The District has also applied for grant funding from the State Water Resources Control Board and the State's infrastructure bank for this project. The District will prepare the appropriate CEQA documentation for this project and anticipates acquiring the necessary permits from the Regional Water Quality Control Board to operate the recycled water distribution system. Construction of Phase 1A of this project has already been initiated in cooperation with the City of Lancaster. The Facilities Planning Study indicates that construction of the backbone recycled water distribution system could be completed by 2011.

In order to provide reliable water supply during high-demand periods in the event that groundwater is temporarily the only available supply of water, the District will construct additional groundwater wells to increase its overall extraction capacity. The District has estimated the cost to construct a well and all associated infrastructure to be \$2 million. To fund the construction of additional wells, the District assesses a fee of \$3,000 per billing unit for each new development in the District, which reflects the proportionate cost to each new customer for constructing a well. The District is currently in the process of designing 10 new wells to serve the District and expects to have them online by March 2008.

Based on the District's efforts described above, the total water supplies available to the District during normal, single-dry, and multiple-dry years with a 20-year projection will meet the projected water demand of the project in addition to the demand of existing and other planned future water uses, including, but not limited to, agricultural and manufacturing uses.

ATTACHMENT A – Bulletin 118 Description of Antelope Valley Groundwater Basin

Antelope Valley Groundwater Basin

- Groundwater Basin Number: 6-44
- County: Los Angeles, Kern, San Bernardino
- Surface Area: 1,010,000 acres (1,580 square miles)

Basin Boundaries and Hydrology

Antelope Valley Groundwater Basin underlies an extensive alluvial valley in the western Mojave Desert. The elevation of the valley floor ranges from 2,300 to 3,500 feet above sea level. The basin is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the southwest by the San Andreas fault zone at the base of the San Gabriel Mountains. The basin is bounded on the east by ridges, buttes, and low hills that form a surface and groundwater drainage divide and on the north by Fremont Valley Groundwater Basin at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gem Hill, and by the Rand Mountains farther east.

Runoff in Big Rock and Little Rock Creeks from the San Gabriel Mountains and in Cottonwood Creek from the Tehachapi Mountains flows toward a closed basin at Rosamond Lake (Jennings and Strand 1969). Rogers Lake is a closed basin in the northern part of Antelope Valley that collects ephemeral runoff from surrounding hills (Rogers 1967). Average annual rainfall ranges from 5 to 10 inches.

Hydrogeologic Information

Water Bearing Formations

The primary water-bearing materials are Pleistocene and Holocene age unconsolidated alluvial and lacustrine deposits that consist of compact gravels, sand, silt, and clay. These deposits are coarse and rich in gravel near mountains and hills, but become finer grained and better sorted toward the central parts of the valley (Duell 1987). Coarse alluvial deposits form the two main aquifers of the basin; a lower aquifer and an upper aquifer. Most of the clays were deposited in large perennial lakes during periods of heavy precipitation. These clays are interbedded with lenses of coarser water-bearing material as thick as 20 feet; in contrast, the clay beds are as thick as 400 feet. The lake deposits form a zone of low permeability between the permeable alluvium of the upper aquifer and that of the lower aquifer, although leakage between the two aquifers may occur (Planert and Williams 1995). The upper aquifer, which is the primary source of groundwater for the valley, is generally unconfined whereas the lower aquifer is generally confined. Specific yield of these deposits ranges from 1 to 30 percent (KJC 1995), and wells typically have a moderate to high ability for water well production.

Restrictive Structures

The Antelope Valley Groundwater Basin is composed of three large sediment-filled structural basins separated by extensively faulted, elevated

bedrock (Dibblee 1967; Londquist and others 1993). The rocks deposited in these basins are disrupted by strike-slip faults, normal faults, and folds, which are related to movement along the active San Andreas and Garlock fault zones. Workers at the USGS have separated the groundwater basin into subbasins using faults that have a difference in groundwater elevation across them (Bloyd 1967; Carlson and others 1998).

In addition to the Garlock and San Andreas fault zones, numerous other faults within the basin impede groundwater flow (Bloyd 1967; Durbin 1978; Carlson and others 1998). Bloyd (1967) described eight groundwater subunits in this basin bounded, in part, by faults that displace the water table. The Randsburg-Mojave, Cottonwood, Willow Springs, Rosamond, and Neenach faults displace the water table in the western part of the basin (Bloyd 1967; Dibblee 1963; 1967; Durbin 1978; Londquist and others 1993; Carlson and others 1998), as does an unnamed fault in the southwestern part of the basin (Bloyd 1967). The El Mirage, Spring, and Blake Ranch faults impede groundwater movement in the eastern part of the basin (Ikehara and Phillips 1994), and three unnamed faults displace the local water table in the southeastern part of the basin (Bloyd 1967). A ridge of bedrock buried beneath the northern part of Rogers Lake is a barrier to groundwater flow (Bloyd 1967) in the northeastern part of the basin.

Recharge

Recharge to the basin is primarily accomplished by perennial runoff from the surrounding mountains and hills. Most recharge occurs at the foot of the mountains and hills by percolation through the head of alluvial fan systems. The Big Rock and Little Rock Creeks, in the southern part of the basin, contribute about 80 percent of runoff into the basin (Durbin 1978). Other minor recharge is from return of irrigation water and septic system effluent (Duell 1987).

Groundwater Level Trends

From 1975 through 1998, groundwater level changes ranged from an increase of 84 feet to a decrease of 66 feet (Carlson and Phillips 1998). The parts of the basin with declining water levels are along the highway 14 corridor from Palmdale through Lancaster to Rosamond and surrounding Rogers Lake on Edwards Air Force Base (Carlson and Phillips 1998).

Historically, groundwater in the basin flowed north from the San Gabriel Mountains and south and east from the Tehachapi Mountains toward Rosamond Lake, Rogers Lake, and Buckhorn Lake. These dry lakes are places where groundwater can discharge by evaporation. Because of recent groundwater pumping, groundwater levels and flow have been altered in urban areas such as Lancaster and Edwards Air Force Base. Groundwater pumping has caused subsidence of the ground surface as well as earth fissures to appear in Lancaster and on Edwards Air Force Base. By 1992, 292 square miles of Antelope Valley had subsided more than one foot. This subsidence has permanently reduced aquifer-system storage by about 50,000 acre-feet (Sneed and Galloway 2000; Ikehara and Phillips 1994).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity has been reported at 68,000,000 af (Planert and Williams 1995) and 70,000,000 af (DWR 1975). For the part of the basin between 20 and 220 feet in depth, the storage capacity has been reported to be 5,400,000 af (Bader 1969).

Groundwater Budget (Type A)

Though a current groundwater budget for the Antelope Valley Groundwater Basin is not available, Durbin (1978) produced a mathematical model for this basin. In addition, Planert and Williams (1995) report 25,803 af of urban extraction and 1,006 af of agricultural extraction for 1992. Fuller (2000) reports an average natural recharge of about 48,000 af, and KJC (1995) reports a range in annual natural recharge of 31,200 to 59,100 af/year.

Groundwater Quality

Characterization. Groundwater is typically calcium bicarbonate in character near the surrounding mountains and is sodium bicarbonate or sodium sulfate character in the central part of the basin (Duell 1987). In the eastern part of the basin, the upper aquifer has sodium-calcium bicarbonate type water and the lower aquifer has sodium bicarbonate type water (Bader 1969). TDS content in the basin averages 300 mg/L and ranges from 200 to 800 mg/L (KJC 1995). Data from 213 public supply wells show an average TDS content of 374 mg/L and ranges from 123 to 1,970 mg/L.

Impairments. High levels of boron and nitrates have been observed (JKC 1995).

Water Quality in Public Supply Wells

Constituent Group ¹	Number of wells sampled ²	Number of wells with a concentration above an MCL ³
Inorganics – Primary	214	25
Radiological	183	6
Nitrates	243	8
Pesticides	207	2
VOCs and SVOCs	207	4
Inorganics – Secondary	214	39

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range to 7,500 gal/min	Average: 286 gal/min
Total depths (ft)		
Domestic		
Municipal/Irrigation		

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
USGS	Groundwater levels	262
USGS	Miscellaneous water quality	10
Department of Health Services and cooperators	Title 22 water quality	248

Basin Management

Groundwater management:	The Antelope Valley Water Group is an ad hoc coalition that plays a large role in groundwater management for this basin. They are developing an AB3030 plan for this basin.
Water agencies	
Public	Boron Community Services District, Desert Lake Community Service District, Los Angeles County Water Works, Littlerock Creek Irrigation District, Mojave Public Utility District, North Edwards Water District, Palmdale Water District, Quartz Hill Water District, Rosamond Community Service District, San Bernardino CountyService Area No. 70L
Private	Antelope Valley Water Company, Edgemont Acres Mutual Water Company, Evergreen Mutual Water Company, Land Project Mutual Water Company, Landale Mutual Water Company, Oak Springs Valley Water Company, Sunnyside Farms Mutual Water Company, White Fence Farms Mutual Water Company

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Additional References

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Errata

Substantive changes made to the basin description will be noted here.

ATTACHMENT B – Water Service Agreement between the District and AVEK

WATER SERVICE AGREEMENT
BETWEEN
ANTELOPE VALLEY-EAST KERN WATER AGENCY
AND

LOS ANGELES COUNTY WATERWORKS DISTRICTS NOS.

4 AND 34

FOR WATER SERVICE

DATED JUL 17 1970

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WATER SERVICE AGREEMENT

THIS AGREEMENT, made and entered into this ____ day of ____ 19__, by and between the Antelope Valley-East Kern Water Agency, established by Chapter 2146 of the 1959 Statutes of the State of California, hereinafter referred to as the "Agency" and Los Angeles County Waterworks Districts Nos. 4 and 34, hereinafter referred to as the "Consumer;"

W I T N E S S E T H :

★ WHEREAS, water is needed within the Agency to supplement existing water supplies and for new areas requiring water supplies; and

★ WHEREAS, groundwater supplies within the Agency are seriously depleted; and

WHEREAS, the Agency and the State of California entered into an agreement entitled "Water Supply Contract Between the State of California, Department of Water Resources, and Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964; Amendment No. 2, dated August 24, 1965; Amendment No. 3, dated February 16, 1967; and Amendment No. 4, dated May 11, 1967, whereby the State of California will furnish a water supply to the Agency; and

WHEREAS, the Agency desires to make available under terms and conditions which, as far as practicable and consistent with the ultimate use of water made available pursuant to said Contract and Amendments, shall be fair and equitable; and

WHEREAS, the inhabitants and lands of the Consumer are in need of additional water for beneficial uses; and

WHEREAS, the Consumer desires to contract with the Agency for a water supply to be for the use and benefit of the Consumer, and for which Consumer will make payment to the Agency upon the terms and conditions hereinafter set forth:

NOW, THEREFORE, IT IS HEREBY MUTUALLY AGREED by and between the parties hereto as follows:

Article 1. Definitions

When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

(a) "Agency" as used herein shall mean Antelope Valley-East Kern Water Agency.

(b) "Consumer" as used herein shall mean any public body, including the United States of America and the State of California, and any of their agencies and departments empowered to contract, counties, cities, districts, local agencies or political subdivisions of the State of California; corporations, public utility water companies, mutual water companies or persons; or any other entity or individual able to and which does execute a Water Service Agreement with the Agency for a water supply; but shall not include any party with whom the Agency may contract to deliver water for a term of years and under special provisions which require the joint use of facilities for the particular benefit of said party and the Agency.

(c) "Agreement" as used herein shall mean this agreement for water service between Agency and Consumer.

(d) "Master Contract" shall mean the contract entitled "Water Supply Contract between the State of California Department of Water Resources and the Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964, Amendment No. 2, dated August 24, 1965, Amendment No. 3, dated February 16, 1967, and Amendment No. 4, dated May 11, 1967, and any revisions, amendments or supplements thereto hereafter made.

(e) "Agency Law" shall mean the Antelope Valley-East Kern Water Agency Law, Chapter 2146, Statutes of 1959 of the State of California, as

amended and as the same may be hereafter amended, supplemented, re-enacted, or codified.

(f) "Project Water" shall mean water made available to the Agency by the State of California pursuant to the terms of the Master Contract.

(g) "Treatment and Distribution System" means all fixed installations owned and operated by the Agency having the purpose of treatment, conveyance, control, measurement, spreading and delivery of water.

(h) "Rules and Regulations" means the Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency, as they may be amended and supplemented from time to time by the Board of Directors of the Agency. The Rules and Regulations set forth the conditions under which water will be distributed to the Consumer.

(i) "Year" means the same as the term "Year" means in the Master Contract.

Article 2. Term of Agreement

This Agreement shall become effective on the date first above written and shall remain in effect during the period necessary to repay any bonds designed to finance the Agency's water system.

Article 3. Relationship to Master Contract, and Application of Agency Law

(a) Consumer acknowledges having read the Master Contract and having general familiarity with its terms and that Agency's ability to supply water is governed by said Master Contract and any subsequent modification and supplements thereof.

(b) Consumer also agrees that this Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

Article 3a. Water Rights

Because it may be necessary that consumer maintain and operate his own wells to provide for his own system peak demands and as an emergency reserve water supply, it is advisable that consumer retain and protect his rights to groundwater.

In the event there is an adjudication of the groundwater basin or any of its sub-units, the Agency will assist the Consumers, if the latter so desire, in retaining their rights in the groundwater supply.

Those Consumers who wish the assistance of the Agency, in the event there is an adjudication of the groundwater basin or any of its sub-units, shall submit evidence of the amount of water pumped from each individual well during at least the preceding five-year period and longer if the information is available. This information may be submitted to the Agency at the time of execution of this Agreement or to the State Water Resources Control Board. The Consumer shall also keep continuous records of the amount of water pumped from each individual well for each year following execution of this Agreement. Each year the Consumer may file this information in writing with the Agency, or with the State Water Resources Control Board.

Agency agrees that in the event of such an adjudication as is mentioned in this Article, the evidence of groundwater use of the basin by the Consumers as may have been filed with the Agency will be presented to the Court or other reviewing officer in aid of the Consumers' retention of their rights in the groundwater supply.

This section is not intended in any way to relieve Consumer of any rights or responsibilities it may have under the Recordation Act of 1955 (Water Code, Sec. 4999, et seq.).

Article 4. Delivery of Water

Agency will deliver water to Consumer through the Agency's treatment and distribution system at water service connections. Water delivered pursuant to this Agreement will be delivered to Consumer in accordance with the conditions and procedures set forth in the Rules and Regulations. Consumer shall make application for water delivery turn-ons and shut-offs in accordance with the procedures set forth in the Rules and Regulations. Consumer agrees to be bound by such Rules and Regulations insofar as the same pertain to the subject matter of this Agreement and by any subsequent amendments or supplements thereof that may be adopted by the Board of Directors of the Agency hereafter from time to time. Agency agrees that amendments or supplements to said Rules and Regulations shall not be made without providing Consumer at least 45 days prior written notice of each such proposed amendment or supplement and of the meeting of the Board at which such amendment or supplement is to be acted upon by said Board.

Despite the foregoing provisions and other terms and conditions contained in other Articles of this Agreement, it is understood and acknowledged that Agency's obligations to deliver water pursuant to this Agreement is conditioned upon its being able to provide a water distribution system with which Consumer can be served and that if Agency is unable to provide such a water system, neither it nor its officers, directors or agents shall have any liability to provide water to Consumer nor be subject to any claims, demands or causes of actions on such account.

Article 5. Water Service Connection(s)

Consumer shall make application to Agency for water service connections through which all or a portion of the water to be delivered pursuant to this Agreement shall be delivered to Consumer. Consumer agrees to pay any and all costs incurred by Agency for the design, construction, inspection, operation and maintenance of water service connection(s) serving Consumer. Application and payment for water service connections shall be in accordance with the procedures set forth in the Rules and Regulations. After the same have been constructed, Agency shall own the water service connections and all appurtenances and facilities a part thereof and related thereto. The water service connection, appurtenances and facilities do not include any portion of consumer's water delivery system designed, constructed, acquired or otherwise owned, operated and maintained by Consumer.


Article 6. Water Delivery Schedules

On or before August 1 of each year, Consumer shall submit in writing to the Agency its requested water deliveries by month from each water service connection for the succeeding five years. All requests shall be submitted in the manner set forth in the Rules and Regulations. All water orders, emergency turnoff, and any other request by Consumer which may alter the requested water delivery schedule shall be reported to Agency so that Agency can revise its delivery schedule with the State pursuant to the Master Contract. Because of the fact that the Agency anticipates being in a position to first deliver water in 1972, a Schedule 1 is attached hereto and hereby made a part hereof by reference whereby Consumer indicates its requested water deliveries by month from each water service connection for the succeeding five-year period, such requests, if this contract is dated before 1972, being shown as zero for each of the months involved prior to 1972. If the contract is entered into after the Agency is in a position to deliver water then the requested water deliveries will reflect Consumer's anticipated water requirements for the entire five-year period. Consumer agrees to take from the Agency when the latter is in a position to deliver water to Consumer, the water requested for the first year of service, and the Agency agrees to deliver such water to the Consumer, subject to the other provisions contained in this Agreement and to the Agency's Rules and Regulations.

Article 7. Measurement

All water furnished pursuant to this Agreement shall be measured by the Agency at each water service connection established pursuant to Article 5 hereof with equipment satisfactory to the Agency. Said equipment shall be installed, owned, operated and maintained by the Agency. All determinations relative to the measuring of water shall be made by the Agency and upon request by the Consumer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in the Rules and Regulations. Any error appearing therein will be adjusted pursuant to conditions set forth in the Rules and Regulations. The Agency will install, or cause to be installed, backflow prevention devices in connection with such measuring devices to prevent water delivered to the Consumer or other consumers from returning to the Agency's treatment and distribution system.

Article 8. Limitations on Obligation of Agency to Furnish Water.

 (a) Notwithstanding any provisions of this Agreement to the contrary, the obligation of the Agency to furnish water hereunder shall be limited to the times and to the extent that water and facilities necessary for furnishing the same are available to the Agency pursuant to the Master Contract with the State of California.

(b) The Agency shall not be liable for the failure to perform any portion of this Agreement to the extent that such failure is caused by the failure of the State of California to perform any obligation imposed on the State of California by the Master Contract; provided, however, that the Agency shall diligently and promptly pursue all rights and remedies available to it to enforce the rights of the Agency, the Consumer and other consumers against the State of California under the Master Contract relative to such failure to perform.

Article 9. Water Shortages

(a) No Liability for Shortages.

Neither the Agency, nor any of its officers, agents or employees, shall be liable for any damage, direct or indirect, arising from any shortages which may occur from time to time in the amount of water to be made available for delivery to the Consumer pursuant to the Master Contract or any other cause beyond the control of the Agency.

(b) Allocation of Water in Times of Shortage.

The Agency reserves the right in the event that at any time the quantity of water available to the Agency pursuant to the Master Contract is less than the aggregate of the requests of all consumers to allocate the quantity of water available to the Agency to the extent permitted by law.

Article 10. Curtailment of Delivery for Maintenance Purposes

The Agency may temporarily discontinue or reduce the amount of water to be furnished to the Consumer for purposes of maintaining, repairing, replacing and investigating or inspecting, any of the facilities necessary for the furnishing of such water to the Consumer. Insofar as it is feasible the Agency will give the Consumer due notice in advance of any such temporary discontinuance or reduction, except in the case of emergency, in which case no notice need be given. In the event of such discontinuance or reduction, the Agency will make available upon resumption of service, as nearly as may be feasible, and to the extent water is available to it, the quantity of water which would have been available to the Consumer in the absence of such discontinuance or reduction.

Article 11. Responsibilities for Delivery and Distribution of Water Beyond Water Service Connection(s)

After such water has passed the Water Service Connection(s) established in accordance with Article 5, neither the Agency nor its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water supplied to the Consumer or for claim of damages of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water beyond said Water Service Connection; and the Consumer shall indemnify and hold harmless the Agency and its officers, agents, and employees from any such damages or claims of damages, and including reasonable attorneys' fees incurred as against the unsuccessful party in defending against any claims or actions for damages on such account.

Article 12. Water Quality

X
The quality of water delivered by the Agency to the Consumer pursuant to this Agreement shall depend upon the quality of the water furnished to the Agency under the Master Contract, except as the same may be modified by the Agency's local treatment of water. The Agency undertakes no responsibility to Consumer to furnish water pursuant to this Agreement of any particular quality except as may result from the above-mentioned source of supply and any treatment provided by the Agency.

Article 13. Payments

Payment of all charges shall be made at the rates, times and in the manner provided for in the "Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency," as the same may be amended and supplemented from time to time by the Board of Directors of the Agency. On or before July 1st of each year, the Agency shall adopt by resolution of the Board of Directors the water rate in dollars per acre-foot which will be charged for water to be delivered in the next succeeding year. At this time, the Agency shall make available to the Consumers the estimated water rates in dollars per acre-foot to be charged for water to be delivered in the second and third succeeding years.

Article 14. Excess Lands

The provisions of Article 30 of the Master contract to the extent applicable shall be binding upon Consumer, and Consumer agrees to obtain and furnish to the Agency such certifications and information as are required to be furnished by the Agency to the State of California by said Article 30.

Article 15. Default

In the event of default by the Consumer in payment to the Agency of any money required to be paid hereunder and pursuant to the Rules and Regulations, the Agency may in its discretion, and in accordance with the Rules and Regulations, suspend delivery of water to the Consumer during the period that the latter is delinquent in its payments.

Article 16. Interest on Overdue Payments.

Upon each charge to be paid by the Consumer to the Agency pursuant to this Agreement which shall remain unpaid after the same shall have become due and payable, interest shall accrue at the rate of one-half of one percent (1/2%) per month of the amount of such delinquent payment from and after the date when the same becomes due until paid, and the Consumer hereby agrees to pay such interest. In no event shall such interest be compounded.

Article 17. Changes in Organization of Consumer

The Consumer will furnish the Agency with maps showing the territorial limits of the Consumer and the service area or areas of its water distribution system. Throughout the term of this Agreement, the Consumer will promptly notify the Agency of any changes, either by inclusion or exclusion, in said territorial limits and service area or areas. Consumer agrees to conform to the requirement of Article 15(a) of the Master Contract that any water wholly or partly delivered by the Agency to Consumer will not be delivered outside of the territorial boundaries of the Agency without written consent having first been obtained.

Article 18. Remedies Not Exclusive

Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

Article 19. Amendments

This Agreement may be amended or supplemented at any time by mutual written agreement of the parties in any manner that may be consistent with the applicable law. In amending or supplementing this Agreement, however, the Agency will bear in mind that substantial uniformity of Agreements between the various Consumers of the Agency is thought to be desirable as to the main contracting concepts and principles that are to be used and therefore will attempt to maintain uniformity between the various Consumers' Agreements in such respects.

Article 20. Opinions and Determinations

Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

Article 21. Waiver of Rights

Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default or matter.

Article 22. Notices

All notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Consumer by such officers and persons as they may, from time to time, authorize in writing to so act. All such notices shall be deemed to have been given and delivered if delivered personally or if enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail. Unless and until formally notified otherwise, all notices shall be addressed to the parties at their addresses as shown on the signature page of this Agreement.

Article 23. Assignment

The provisions of this Agreement shall apply to and bind the successors and assigns of the respective parties, but no assignment or transfer of this Agreement, nor any part hereof nor interest herein by the Consumer shall be valid until and unless approved by the Agency, except an assignment to an affiliate of the Consumer, or to a party or parties, which by merger, consolidation, dissolution, purchase or otherwise, shall succeed to substantially all of the assets and business of the Consumer. Affiliate, as used herein, shall mean a corporation that directly or indirectly, through one or more intermediaries, controls, or is controlled by, or is under common control with, the assigning party.

Article 24. Inspection of Books and Records

The proper officers or agents of the Consumer shall have full and free access at all reasonable times to the account books and official records of the Agency insofar as the same pertain to the matters and things provided for in this Agreement, with the right at any time during office hours to make copies thereof at the Consumer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights in respect to the account books and records of the Consumer.

Article 25. Validation

At any time after the execution of this Agreement, either party may if it so desires submit this Agreement to a Court of competent jurisdiction for a determination of its validity, and whichever party elects to follow such a procedure the other party agrees to cooperate therein to any extent that may be necessary or advisable and that shall be requested by the plaintiff. The plaintiff shall bear the costs and attorneys' fees incurred in such a proceeding.

Article 26. Uniformity of Provisions

It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the various Consumers entering into this Agreement with the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into that will substantially affect the interests of Agency's Consumers generally in the Agency's opinion shall as provided in Article 19 hereof be made available to all Consumers entering into this Agreement with the Agency on an equal basis.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date first above written.

Approved as to Form and Sufficiency

By: 

Attorney for Agency

ATTEST:

BY: 

Secretary

Antelope Valley-East
Kern Water Agency

ANTELOPE VALLEY-EAST KERN
WATER AGENCY

554 West Lancaster Boulevard
Lancaster, California 93534
(805) 942-8439

By: 

President

DISTRICTS:

LOS ANGELES COUNTY WATERWORKS
DISTRICTS NOS. 4 AND 34

(SEAL)

ERNEST E. DEBS

Chairman of the Board of
Supervisors of the County of
Los Angeles, State of
California, as the governing
body of said Districts.

Approved as to Form:

John D. Maharg, County Counsel

By: 

Deputy

JUL 17 1970

Date Executed

(SEAL)

Attest:

James S. Mize, Executive
Officer-Clerk of the Board
of Supervisors of the County
of Los Angeles

By: FRANCES L. HUSBY

Deputy


ADOPTED

BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES

50

JUL 14 1970

31


JAMES S. MIZE
EXECUTIVE OFFICER

ATTACHMENT C – Water Supply Tables for the District during normal, single- and multiple-dry years

discussed above) of AVEK's Table A Amount available to the Study Area. Demand estimates are based on the per capita projections developed in Section 4. Conservation was determined assuming a 2.0 percent reduction per five-year interval for a maximum reduction of 10 percent in 2030.

As shown by the comparison, all of the water purveyors will have sufficient supply to the increasing demand through 2030 with the implementation of the planned water supplies, assuming the availability of groundwater remains the same. Again, the table reflects the water purveyors' practice of conserving groundwater for additional availability in dry water years.

**TABLE 3-4
AVERAGE WATER YEAR ASSESSMENT**

	2010	2015	2020	2025	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR ^(a)	0	0	0	0	0
Imported Water	69,800	70,400	70,000	68,600	64,500
Total Existing Supply	89,800	90,400	90,000	88,600	84,500
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	16,400	3,300	(9,900)	(22,500)	(36,600)
Difference as Percent of Supply	18	4	(11)	(25)	(43)
Difference as Percent of Demand	22	4	(10)	(20)	(30)
Planned Water Supplies					
New Supply	0	0	2,000	11,600	23,100
Recycled Water	2,700	5,400	8,200	10,900	13,600
Total Planned Supply	2,700	5,400	10,200	22,500	36,700
Total Existing and Planned Supplies	92,500	95,800	100,200	111,100	121,200
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	19,100	8,700	300	0	100
Difference as Percent of Supply	21	9	0	0	0
Difference as Percent of Demand	26	10	0	0	0

**TABLE 3-5
SINGLE DRY WATER YEAR ASSESSMENT**

	2010	2015	2020	2025	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	31,600	31,600
Imported Water	6,900	6,800	6,500	6,300	5,900
Total Existing Supply	58,500	58,400	58,100	57,900	57,500
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	(14,900)	(28,700)	(41,800)	(53,200)	(63,600)
Difference as Percent of Supply	(25)	(49)	(72)	(92)	(111)
Difference as Percent of Demand	(20)	(33)	(42)	(48)	(53)
Planned Water Supplies					
Groundwater Banking/New Supplies	12,300	23,400	33,700	42,400	50,100
Recycled Water	2,700	5,400	8,200	10,900	13,600
Total Planned Supply	15,000	28,800	41,900	53,300	63,700
Total Existing and Planned Supplies	73,500	87,200	100,000	111,200	121,200
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-6
MULTI DRY WATER YEAR ASSESSMENT 2006-2010**

	2006	2007	2008	2009	2010
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASF	0	0	0	0	0
Imported Water	17,800	17,800	17,800	17,700	17,700
Total Existing Supply	37,800	37,800	37,800	37,700	37,700
District 40 Demand (w/out conservation)	61,800	65,000	68,300	71,600	74,900
Conservation	200	500	800	1,100	1,500
Demand (w/conservation)	61,600	64,500	67,500	70,500	73,400
Difference (supply minus demand)	(23,800)	(26,700)	(29,700)	(32,800)	(35,700)
Difference as Percent of Supply	(63)	(71)	(79)	(87)	(95)
Difference as Percent of Demand	(39)	(41)	(44)	(47)	(49)
Planned Water Supplies					
Groundwater Banking/New Supplies	23,400	25,700	28,200	30,700	33,100
Recycled Water	500	1100	1600	2200	2700
Total Planned Supply	23,900	26,800	29,800	32,900	35,800
Total Existing and Planned Supplies	61,700	64,600	67,600	70,600	73,500
District 40 Demand (w/out conservation)	61,800	65,000	68,300	71,600	74,900
Conservation	200	500	800	1,100	1,500
Demand (w/conservation)	61,600	64,500	67,500	70,500	73,400
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-7
MULTI DRY WATER YEAR ASSESSMENT 2011-2015**

	2011	2012	2013	2014	2015
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	100	0	0	0
Imported Water	17,600	17,500	17,500	17,400	17,300
Total Existing Supply	69,200	37,600	37,500	37,400	37,300
District 40 Demand (w/out conservation)	78,100	81,200	84,400	87,600	90,700
Conservation	1,900	2,300	2,700	3,200	6,300
Demand (w/conservation)	76,200	78,900	81,700	84,400	84,400
Difference (supply minus demand)	(7,000)	(41,300)	(44,200)	(47,000)	(47,100)
Difference as Percent of Supply	(10)	(110)	(118)	(126)	(126)
Difference as Percent of Demand	(9)	(52)	(54)	(56)	(56)
Planned Water Supplies					
Groundwater Banking/New Supplies	3,800	37,600	39,900	42,200	41,800
Recycled Water	3,300	3,800	4,400	4,900	5,400
Total Planned Supply	7,100	41,400	44,300	47,100	47,200
Total Existing and Planned Supplies	76,300	79,000	81,800	84,500	84,500
District 40 Demand (w/out conservation)	78,100	81,200	84,400	87,600	90,700
Conservation	1,900	2,300	2,700	3,200	6,300
Demand (w/conservation)	76,200	78,900	81,700	84,400	84,400
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-8
MULTI DRY WATER YEAR ASSESSMENT 2016-2020**

	2016	2017	2018	2019	2020
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	100	0	0
Imported Water	17,200	17,100	17,000	16,900	16,800
Total Existing Supply	68,800	68,700	37,100	36,900	36,800
District 40 Demand (w/out conservation)	94,000	97,000	100,000	103,200	106,300
Conservation	4,100	4,700	5,200	5,800	6,400
Demand (w/conservation)	89,900	92,300	94,800	97,400	99,900
Difference (supply minus demand)	(21,100)	(23,600)	(57,700)	(60,500)	(63,100)
Difference as Percent of Supply	(31)	(34)	(156)	(164)	(171)
Difference as Percent of Demand	(23)	(26)	(61)	(62)	(63)
Planned Water Supplies					
Groundwater Banking/New Supplies	15,200	17,200	50,700	53,000	55,000
Recycled Water	6,000	6,500	7,100	7,600	8,200
Total Planned Supply	21,200	23,700	57,800	60,600	63,200
Total Existing and Planned Supplies	90,000	92,400	94,900	97,500	100,000
District 40 Demand (w/out conservation)	94,000	97,000	100,000	103,200	106,300
Conservation	4,100	4,700	5,200	5,800	6,400
Demand (w/conservation)	89,900	92,300	94,800	97,400	99,900
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-9
MULTI DRY WATER YEAR ASSESSMENT 2021-2025**

	2021	2022	2023	2024	2025
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	200	0
Imported Water	16,600	16,500	16,300	16,200	16,000
Total Existing Supply	68,200	68,100	67,900	36,400	36,000
District 40 Demand (w/out conservation)	109,200	112,100	115,000	117,900	120,800
Conservation	7,000	7,600	8,300	9,000	9,600
Demand (w/conservation)	102,200	104,500	106,700	108,900	111,200
Difference (supply minus demand)	(34,000)	(36,400)	(38,800)	(72,500)	(75,200)
Difference as Percent of Supply	(50)	(53)	(57)	(199)	(209)
Difference as Percent of Demand	(33)	(35)	(36)	(67)	(68)
Planned Water Supplies					
Groundwater Banking/New Supplies	25,400	27,300	29,100	62,300	64,400
Recycled Water	8,700	9,200	9,800	10,300	10,900
Total Planned Supply	34,100	36,500	38,900	72,600	75,300
Total Existing and Planned Supplies	102,300	104,600	106,800	109,000	111,300
District 40 Demand (w/out conservation)	109,200	112,100	115,000	117,900	120,800
Conservation	7,000	7,600	8,300	9,000	9,600
Demand (w/conservation)	102,200	104,500	106,700	108,900	111,200
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-10
MULTI DRY WATER YEAR ASSESSMENT 2026-2030**

	2026	2027	2028	2029	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	31,600	300
Imported Water	15,800	15,600	15,400	15,200	15,100
Total Existing Supply	67,400	67,200	67,000	66,800	35,400
District 40 Demand (w/out conservation)	123,500	126,300	129,000	131,800	134,600
Conservation	10,400	11,100	11,900	12,700	13,500
Demand (w/conservation)	113,100	115,200	117,100	119,100	121,100
Difference (supply minus demand)	(45,700)	(48,000)	(50,100)	(52,300)	(85,700)
Difference as Percent of Supply	(68)	(71)	(75)	(78)	(242)
Difference as Percent of Demand	(40)	(42)	(43)	(44)	(71)
Planned Water Supplies					
Groundwater Banking/New Supplies	34,400	46,900	37,700	39,300	72,200
Recycled Water	11,400	1,200	12,500	13,100	13,600
Total Planned Supply	45,800	48,100	50,200	52,400	85,800
Total Existing and Planned Supplies	113,200	115,300	117,200	119,200	121,200
District 40 Demand (w/out conservation)	123,500	126,300	129,000	131,800	134,600
Conservation	10,400	11,100	11,900	12,700	13,500
Demand (w/conservation)	113,100	115,200	117,100	119,100	121,100
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

WATER SUPPLY ASSESSMENT

**Tentative Tract Nos. 62758 and 62759
in the City of Lancaster**

December 12, 2006

Prepared by:

Los Angeles County Waterworks District No. 40, Antelope Valley

INTRODUCTION

This report is a Water Supply Assessment (Assessment) prepared by Los Angeles County Waterworks District No. 40, Antelope Valley (District), at the request of the City of Lancaster for the proposed Tentative Tract Nos. 62758 and 62759 (Project). Pursuant to California Water Code §10910, et seq., the District has been identified as the public water system which may supply water to the Project. In connection with the City of Lancaster's environmental assessment of the Project and pursuant to the requirements of California Water Code §10910, et seq., the District was requested to prepare a Assessment to determine whether the District's projected supply will meet the demands for the Project, in addition to existing and future planned water uses in the District.

A California Water Code §10910, et seq., Assessment is required for any "project" that is subject to the California Environmental Quality Act (CEQA), and proposes residential development of more than 500 dwelling units. The Project is a qualifying project under this definition. No Assessment has been previously prepared for the Project that complies with the requirements of California Water Code §10910, et seq.

A. Project Description

Tentative Tract No. 62758 is located in the area generally bounded by Avenue H, 60th Street West, Avenue H-4, and 65th Street West in the City of Lancaster. Tentative Tract No. 62659 is located in the area generally bounded by Avenue H, 50th Street West, Avenue H-8, and 55th Street West in the City of Lancaster. Based on information provided, the Project includes the development of 739 single-family residential lots on approximately 190 acres. The Project also includes improvements to existing roadways and construction of several local roadways throughout the Project site. The Project site is currently undeveloped with no water supply infrastructure in place. Upon completion, the total water demand for the Project is estimated to be approximately 887 acre-feet per year (af/yr).

B. Purpose of the Assessment

The purpose of this Assessment is to provide an analysis to the City of Lancaster of whether the District's water system has sufficient projected water supplies to meet the projected demands of the Project. Specifically, this Assessment evaluates whether the total projected water supply for normal, single-dry, and multiple-dry water years over the next 20 years will meet the projected water demand associated with the Project in addition to existing and future planned water uses. If the water supply is determined to be insufficient, the Assessment must describe the steps that will be taken to obtain an adequate supply. This Assessment is required by the California Water Code §10910, et seq., to be included in the Environmental Impact Report prepared for the Project pursuant to the CEQA.

C. Description of the District

The District is a public water agency that serves portions of the Cities of Lancaster and Palmdale and several small communities in the eastern portion of the Antelope Valley located in Los Angeles County.

The District supplements local groundwater supplies with State Water Project (SWP) water from Northern California. SWP water is treated and delivered to the District by the Antelope Valley-East Kern Water Agency (AVEK).

D. Supporting Information

Information from the following documentation has been used in the preparation of this Assessment. The referenced documents are incorporated into this Assessment as if fully set forth herein. Most of these documents are available on the District's website (www.lacwaterworks.org) or can be reproduced by the District for a nominal fee.

- 2005 Integrated Urban Water Management Plan for the Antelope Valley, December 2005
- State Water Project Delivery Reliability Report, California Department of Water Resources, May 2006
- Antelope Valley Water Resource Study, Kennedy-Jenks Consultants, November 1995
- Lancaster Subbasin Aquifer Storage and Recovery Demonstration Project Final Report, Los Angeles County Department of Public Works, January 2000
- Planned Utilization of Water Resources in Antelope Valley, California Department of Water Resources, October 1980
- Report on existing and projected water demands and source of supply for the Antelope Valley, Los Angeles County Waterworks Districts, March 1991
- Final Facilities Planning Report, North Los Angeles County Recycled Water Project, Los Angeles County Waterworks Districts, March 2006

WATER SUPPLY ASSESSMENT

Based on the scope of the Project, the District has reviewed the 2005 Integrated Urban Water Management Plan for the Antelope Valley (IUWMP), and determined that the population growth associated with the Project is included in the projected population and water demand for the District in the IUWMP. The IUWMP projects a population growth within the District between 2005 and 2015 of 86,347 people (28,200 customers) and a corresponding increase in overall yearly water demand in the District of 32,200 acre-feet. Since the beginning of 2005, the District has committed to supply water to nearly 26,000 new customers representing a water demand of over 31,000 af/yr. Table 1 below summarizes these customers and the addition of the customers associated with the Project.

Table 1

	Customers	Water Demand (af/yr)
New Customers Since 2005	5,300	6,360
Future customers with Will-Serve Letters	3,046	3,655
Future customers from approved developments	862	1,034
Customers in planned developments accounted for in the IUWMP	14,325	17,190
Customers with completed Water Supply Assessments	1,594	2,100
Customers associated with TTMs 060610 and 060620	820	984
Customers associated with TTMs 062578 and 062579	739	887
Total	26,686¹	32,210¹

¹ Although it appears from these numbers that the District is adding customers at a faster pace than what was projected in the IUWMP, many of the planned developments associated with these numbers will not be completed for several more years.

The IUWMP identifies groundwater and imported SWP water as the two existing sources of water to supply the demand for the District. Table 2 below shows the District's water supply sources in acre-feet during the last five years.

Table 2

	2001	2002	2003	2004	2005
Groundwater	21,736	21,194	16,897	21,348	18,334
Imported Water	30,965	33,440	37,442	36,231	35,935
Total	52,701	54,634	54,339	57,579	54,269

A. Available Groundwater

The Antelope Valley Groundwater Basin (Basin) is the only local source of supply for the District and is comprised of two primary aquifers (commonly referred to as the deep aquifer and the principal aquifer). The excerpt from the State of California Department of Water Resources Bulletin 118 that describes the Basin is included as Attachment A.

Pumping of groundwater has significantly exceeded the natural recharge to the Basin. According to the United States Geologic Survey, the safe yield of the Basin is estimated to be between 31,200 af/yr and 59,100 af/yr. Although the State of California Department of Water Resources (DWR) has not identified the Basin as overdrafted or projected that the Basin will become overdrafted in its most current bulletin, DWR's Bulletin 118, the District is undertaking efforts to eliminate potential long-term overdraft in its conditions in the Basin.

The District currently operates 35 active groundwater wells in the Basin. Although the Basin is not currently adjudicated, the IUWMP provides a goal for the District to limit pumping to an average of 20,000 af/yr based on an expected groundwater basin management program that would bring extractions back in

line with the perennial yield of the Basin. The District pumped between 17,000 and 22,000 af/yr from the Basin in each of the last five years. The District also initiated a full-scale Aquifer Storage Recovery (ASR) project in 2005 to inject and store treated SWP water in the Basin for later use to supplement available water supplies. Since the initiation of this ASR project in 2005, the District has stored 1,542 acre-feet of SWP water in the Basin through the ASR project.

Through its rates paid to AVEK, the District has been contributing to the subsidy of the price of imported water for use by agriculture in-lieu of pumping groundwater. Said in-lieu subsidies are estimated by AVEK to have reduced groundwater extraction by agriculture from the Basin in excess of 400,000 acre-feet.

In 2004, the District filed an action to adjudicate the groundwater rights of the Basin, which is expected to institute a physical solution for groundwater management to prevent long-term overdraft conditions. The physical solution is expected to result in a management program that will include increases in imports of water from outside of the Basin, adoption of water conservation measures, and the increase in the use of recycled water.

B. Available Imported Surface Water

The District also utilizes imported SWP water purchased from AVEK. AVEK is a SWP contractor with a Table A amount of 141,400 acre-feet. The Water Service Agreement between the District and AVEK is included as Attachment B. The IUWMP projects that on average between 64,500 and 70,400 af/yr of imported water will be available to the District from AVEK between 2005 and 2030.

C. Available Water Supply During An Average/Normal Year

Table 3 shows the past water supply for the District during a normal year.

Table 3 – Historic Water Supply Sources

Water Supply Sources	1990	1995	2000	2005
Purchased from AVEK	21,232	21,692	34,655	35,935
Supplier produced groundwater	13,905	19,795	17,419	18,334
Total	35,137	41,486	52,074	54,269

As shown in the tables included in Attachment C, the existing supplies for the District during normal years are sufficient to meet projected increases in water demands through 2015. To assure the District receives a reliable supply of imported water each year, the District assesses a water supply reliability fee to all new developments that is used to construct or secure facilities to store available imported water during wet years for use in dry years. Beyond 2015, the District will utilize recycled water and other planned new water supplies to meet increasing demands. The following actions must be undertaken by the District and other Agencies to assure a reliable water supply during normal years.

Increased Treatment and Well Capacity

The current treatment plant capacity from the two AVEK water treatment plants that serve the District is 75-million-gallons per day (MGD). The District currently receives about 87 percent of the water produced by AVEK. However, during the hot summer months, the District receives, on average, 70 percent of the flow from AVEK's Quartz Hill Treatment Plant and all of the flow from AVEK's Eastside Treatment Plant representing a combined flow of 55 MGD. In addition, the District's wells can produce a total capacity of 38 MGD. During the summer, the daily demand in the District is roughly twice the average day demand in the District. Therefore, by 2015 the daily summer demand in the District will approach 160 MGD. In order to supply this quantity of water during the summer, the District plans to construct additional wells and the capacity of AVEK's treatment plants must be increased. To fund the construction of the new wells, the District assesses a groundwater supply fee to all new developments.

Recycled Water

In March 2006, the District, in cooperation with other agencies in the Antelope Valley, prepared a Facilities Planning Report for the North Los Angeles County Recycled Water Project. This Report identifies potential recycled water users and provides preliminary designs and cost estimates to construct a recycled water backbone distribution system in the Antelope Valley to convey treated wastewater from the Los Angeles County Sanitation Districts' treatment plants to customers. This Report is available on the District's website. Based on this Report, approximately 13,600 acre-feet of recycled water per year can be used by the District's existing and future customers. The District assesses a recycled water fee to all new developments that will fund the design and construction of this recycled water backbone distribution system.

Water Conservation/Reduced Irrigation Demand

The District also promotes conservation throughout its service area and estimates that by 2030, 10 percent of the overall demand in the District will be met through conservation efforts. The Project can include implementation of water conservation measures to reduce the overall demand to the District. In general, landscape irrigation can account for up to 70 percent of the water consumed at local residences. In order to reduce the water demand for this Project, specific measures could be included such as the use of xeriscaping, low water-use turf, or a synthetic grass substitute at every private residence to minimize or eliminate the

irrigation demand from this Project. In addition, weather-sensitive irrigation timers could be installed to assure all landscaping receives only the specific amount of water that it needs.

D. Available Supply During a Single-Dry Year

As shown in the tables included in Attachment C, a significant portion of the District's water supply during dry years will be met with water stored in groundwater banks. The District's water supply reliability fee assessed to all new developments will be used to construct these groundwater banks or secure storage space in existing facilities and purchase available water during wet years to store in these banks or the local Basin for use in dry years.

E. Available Supply During Multiple-Dry Years

As shown in the tables included in Attachment C, the IUWMP projects a water supply portfolio for the District during multiple-dry years that is similar to the available water supply during single-dry years including a combination of imported water, groundwater, recycled water, water stored in groundwater banks, and water stored as part of the District's ASR project.

CONCLUSION/PLANS FOR CONSTRUCTING NEW FACILITIES

As indicated in this Assessment, while the District's existing water supplies are sufficient to meet the demands associated with the Project, sufficient facilities do not yet exist to assure the reliability of these supplies. Specifically, a groundwater storage program must be developed and the capacity of AVEK's treatment plants must be increased in order to assure a reliable supply of imported and stored water to the District. In addition, a recycled water backbone distribution system must be designed and constructed to bring recycled water available from the Los Angeles County Sanitation Districts into the District's service area.

The District has estimated the cost to establish a groundwater bank sufficient to maximize its available imported water supply from AVEK will be \$68 million. To fund the design and construction of a bank, the District assesses a fee of \$1,500 per billing unit for each new development in the District. The District has committed to work with the Antelope Valley State Water Project Contractors Association in establishing a groundwater banking program in the Antelope Valley. The District intends to send its Request for Proposals (RFP) in early 2007 to secure up to an additional 63,500 acre-feet of water per year during dry water years through water banking programs. In addition to funding the design and construction of a groundwater bank, the appropriate CEQA documentation must be prepared. If a groundwater bank is constructed in the Antelope Valley, a Waste Discharge Permit will be required from the Lahontan Regional Water Quality Control Board, and additional permits from the State Department of Water Resources, local landowners, and the local jurisdictions must be acquired. The District is currently establishing short-term groundwater banking

agreements with parties that already operate or have access to existing groundwater banks until a permanent groundwater bank can be established in the Antelope Valley. The District anticipates a permanent groundwater bank will be constructed in phases in the Antelope Valley between 2007 and 2025 as the storage and extraction capacity requirements increase with demand in the District's service area.

The Facilities Planning Study for the North Los Angeles County Recycled Water Project estimated the cost to design and construct the backbone recycled water distribution system for the District would be \$120 million. To fund this project, the District assesses a fee of \$1,200 per billing unit for each new development in the District. The District has also applied for grant funding from the State Water Resources Control Board and the State's infrastructure bank for this project. The District will prepare the appropriate CEQA documentation for this project and anticipates acquiring the necessary permits from the Regional Water Quality Control Board to operate the recycled water distribution system. Construction of Phase 1A of this project has already been initiated in cooperation with the City of Lancaster. The Facilities Planning Study indicates that construction of the backbone recycled water distribution system could be completed by 2011.

In order to provide reliable water supply during high-demand periods in the event that groundwater is temporarily the only available supply of water, the District will construct additional groundwater wells to increase its overall extraction capacity. The District has estimated the cost to construct a well and all associated infrastructure to be \$2 million. To fund the construction of additional wells, the District assesses a fee of \$3,000 per billing unit for each new development in the District, which reflects the proportionate cost to each new customer for constructing a well. The District is currently in the process of designing 10 new wells to serve the District and expects to have them online by March 2008.

Based on the District's efforts described above, the total water supplies available to the District during normal, single-dry, and multiple-dry years with a 20-year projection will meet the projected water demand of the project in addition to the demand of existing and other planned future water uses, including, but not limited to, agricultural and manufacturing uses.

ATTACHMENT A – Bulletin 118 Description of Antelope Valley Groundwater Basin

- Durbin, T. J. 1978. Calibration of a mathematical model of the Antelope Valley ground-water basin, California. U. S. Geological Survey Water-Supply Paper 2046. 51 p.
- Fuller, Russ, Antelope Valley – East Kern Water Agency. 2000. Oral communication with D. Gamon, Department of Water Resources, Southern District. October 2000.
- Ikehara, M.E. and Phillips, S.P. 1994. Determination of Land Subsidence Related to Ground-Water-Level Declines Using Global Positioning System and Leveling Surveys in Antelope Valley, Los Angeles and Kern Counties, California, 1992. U.S. Geological Survey Water-Resources Investigations Report 94-4184. 101 p.
- Kennedy/Jenks Consultants (KJC). 1995. Antelope Valley Water Resources Study. Consultant's report prepared for the Antelope Valley Water Group, November 1995.
- Londquist, C.J., D.L. Rewis, D. L. Galloway, and W. F. McCaffery. 1993. Hydrogeology and land subsidence, Edwards Air Force Base, Antelope Valley, California, January 1989-December 1991. U.S. Geological Survey Water-Resources Investigations Report 93-4114. 74 p.
- Planert, Michael, and John S. Williams. 1995. Ground Water Atlas of the United States – Segment 1 California Nevada. U. S. Geological Survey Hydrologic Investigations Atlas 730-B.
- Sneed, Michelle, and D. L. Galloway. 2000. Aquifer-System Compaction and Land Subsidence: Measurements, Analyses, and Simulations-the Holly Site, Edwards Air Force Base, Antelope Valley, California. U.S. Geological Survey Water Resources Investigations Report 00-4015. 65 p.

Additional References

- California Department of Water Resources (DWR), Southern District. 1968. *Ground-water and waste-water quality study, Antelope Valley, Los Angeles and Kern Counties*. A report to Lahontan Regional Water Quality Control Board, No. 6. 95 p.
- Galloway, Devin L., Steven P. Phillips, and Marti E. Ikehara. 1998. Land Subsidence and its Relation to Past and Future Water Supplies in Antelope Valley, California. In Borchers, James W. ed. *Land Subsidence Case Studies and Current Research*. Proceedings of the Dr. Joseph F. Poland Symposium. Association of Engineering Geologists. Star Publishing Company: Belmont, California. P. 529-539.
- Moyle, W. R. 1974. *Geohydrologic Map of Southern California*. U.S. Geological Survey Water-Resources Investigations 48-73.
- Templin, William, E., Phillips, Steven P, Cherry, Daniel E., DeBortoli, Myrna L., and others. 1994. *Land Use and Water Use in the Antelope Valley, California*. U.S. Geological Survey Water-Resources Investigations Report 94-4208. 97 p.

Errata

Substantive changes made to the basin description will be noted here.

Well Production Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range to 7,500 gal/min	Average: 286 gal/min
Total depths (ft)		
Domestic		
Municipal/Irrigation		

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
USGS	Groundwater levels	262
USGS	Miscellaneous water quality	10
Department of Health Services and cooperators	Title 22 water quality	248

Basin Management

Groundwater management:	The Antelope Valley Water Group is an ad hoc coalition that plays a large role in groundwater management for this basin. They are developing an AB3030 plan for this basin.
Water agencies	
Public	Boron Community Services District, Desert Lake Community Service District, Los Angeles County Water Works, Littlerock Creek Irrigation District, Mojave Public Utility District, North Edwards Water District, Palmdale Water District, Quartz Hill Water District, Rosamond Community Service District, San Bernardino CountyService Area No. 70L
Private	Antelope Valley Water Company, Edgemont Acres Mutual Water Company, Evergreen Mutual Water Company, Land Project Mutual Water Company, Landale Mutual Water Company, Oak Springs Valley Water Company, Sunnyside Farms Mutual Water Company, White Fence Farms Mutual Water Company

References Cited

- Bader, J. S. 1969. Ground-Water Data as of 1967, South Lahontan Subregion, California. U.S. Geological Survey Open File Report. 25 p.
- California Department of Water Resources (DWR). 1975. California's Ground Water. Bulletin 118. 135 p.
- Carlson, Carl S. and Steven P. Phillips. 1998. Water-Level Changes (1975-1998) in the Antelope Valley, California. U.S. Geological Survey Open File Report 98-561.
- Dibblee, T. W., Jr. 1967. Areal geology of the Western Mojave Desert, California. U. S. Geological Survey Professional Paper 522. 153 p.
- Duell, L. F., Jr. 1987. Geohydrology of the Antelope Valley Area California and design for a ground-water-quality monitoring network. U. S. Geological Survey Water-Resources Investigations Report 84-4081. 72 p.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity has been reported at 68,000,000 af (Planert and Williams 1995) and 70,000,000 af (DWR 1975). For the part of the basin between 20 and 220 feet in depth, the storage capacity has been reported to be 5,400,000 af (Bader 1969).

Groundwater Budget (Type A)

Though a current groundwater budget for the Antelope Valley Groundwater Basin is not available, Durbin (1978) produced a mathematical model for this basin. In addition, Planert and Williams (1995) report 25,803 af of urban extraction and 1,006 af of agricultural extraction for 1992. Fuller (2000) reports an average natural recharge of about 48,000 af, and KJC (1995) reports a range in annual natural recharge of 31,200 to 59,100 af/year.

Groundwater Quality

Characterization. Groundwater is typically calcium bicarbonate in character near the surrounding mountains and is sodium bicarbonate or sodium sulfate character in the central part of the basin (Duell 1987). In the eastern part of the basin, the upper aquifer has sodium-calcium bicarbonate type water and the lower aquifer has sodium bicarbonate type water (Bader 1969). TDS content in the basin averages 300 mg/L and ranges from 200 to 800 mg/L (KJC 1995). Data from 213 public supply wells show an average TDS content of 374 mg/L and ranges from 123 to 1,970 mg/L.

Impairments. High levels of boron and nitrates have been observed (JKC 1995).

Water Quality in Public Supply Wells

Constituent Group ¹	Number of wells sampled ²	Number of wells with a concentration above an MCL ³
Inorganics – Primary	214	25
Radiological	183	6
Nitrates	243	8
Pesticides	207	2
VOCs and SVOCs	207	4
Inorganics – Secondary	214	39

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

bedrock (Dibblee 1967; Londquist and others 1993). The rocks deposited in these basins are disrupted by strike-slip faults, normal faults, and folds, which are related to movement along the active San Andreas and Garlock fault zones. Workers at the USGS have separated the groundwater basin into subbasins using faults that have a difference in groundwater elevation across them (Bloyd 1967; Carlson and others 1998).

In addition to the Garlock and San Andreas fault zones, numerous other faults within the basin impede groundwater flow (Bloyd 1967; Durbin 1978; Carlson and others 1998). Bloyd (1967) described eight groundwater subunits in this basin bounded, in part, by faults that displace the water table. The Randsburg-Mojave, Cottonwood, Willow Springs, Rosamond, and Neenach faults displace the water table in the western part of the basin (Bloyd 1967; Dibblee 1963; 1967; Durbin 1978; Londquist and others 1993; Carlson and others 1998), as does an unnamed fault in the southwestern part of the basin (Bloyd 1967). The El Mirage, Spring, and Blake Ranch faults impede groundwater movement in the eastern part of the basin (Ikehara and Phillips 1994), and three unnamed faults displace the local water table in the southeastern part of the basin (Bloyd 1967). A ridge of bedrock buried beneath the northern part of Rogers Lake is a barrier to groundwater flow (Bloyd 1967) in the northeastern part of the basin.

Recharge

Recharge to the basin is primarily accomplished by perennial runoff from the surrounding mountains and hills. Most recharge occurs at the foot of the mountains and hills by percolation through the head of alluvial fan systems. The Big Rock and Little Rock Creeks, in the southern part of the basin, contribute about 80 percent of runoff into the basin (Durbin 1978). Other minor recharge is from return of irrigation water and septic system effluent (Duell 1987).

Groundwater Level Trends

From 1975 through 1998, groundwater level changes ranged from an increase of 84 feet to a decrease of 66 feet (Carlson and Phillips 1998). The parts of the basin with declining water levels are along the highway 14 corridor from Palmdale through Lancaster to Rosamond and surrounding Rogers Lake on Edwards Air Force Base (Carlson and Phillips 1998).

Historically, groundwater in the basin flowed north from the San Gabriel Mountains and south and east from the Tehachapi Mountains toward Rosamond Lake, Rogers Lake, and Buckhorn Lake. These dry lakes are places where groundwater can discharge by evaporation. Because of recent groundwater pumping, groundwater levels and flow have been altered in urban areas such as Lancaster and Edwards Air Force Base. Groundwater pumping has caused subsidence of the ground surface as well as earth fissures to appear in Lancaster and on Edwards Air Force Base. By 1992, 292 square miles of Antelope Valley had subsided more than one foot. This subsidence has permanently reduced aquifer-system storage by about 50,000 acre-feet (Sneed and Galloway 2000; Ikehara and Phillips 1994).

Antelope Valley Groundwater Basin

- Groundwater Basin Number: 6-44
- County: Los Angeles, Kern, San Bernardino
- Surface Area: 1,010,000 acres (1,580 square miles)

Basin Boundaries and Hydrology

Antelope Valley Groundwater Basin underlies an extensive alluvial valley in the western Mojave Desert. The elevation of the valley floor ranges from 2,300 to 3,500 feet above sea level. The basin is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the southwest by the San Andreas fault zone at the base of the San Gabriel Mountains. The basin is bounded on the east by ridges, buttes, and low hills that form a surface and groundwater drainage divide and on the north by Fremont Valley Groundwater Basin at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gem Hill, and by the Rand Mountains farther east.

Runoff in Big Rock and Little Rock Creeks from the San Gabriel Mountains and in Cottonwood Creek from the Tehachapi Mountains flows toward a closed basin at Rosamond Lake (Jennings and Strand 1969). Rogers Lake is a closed basin in the northern part of Antelope Valley that collects ephemeral runoff from surrounding hills (Rogers 1967). Average annual rainfall ranges from 5 to 10 inches.

Hydrogeologic Information

Water Bearing Formations

The primary water-bearing materials are Pleistocene and Holocene age unconsolidated alluvial and lacustrine deposits that consist of compact gravels, sand, silt, and clay. These deposits are coarse and rich in gravel near mountains and hills, but become finer grained and better sorted toward the central parts of the valley (Duell 1987). Coarse alluvial deposits form the two main aquifers of the basin; a lower aquifer and an upper aquifer. Most of the clays were deposited in large perennial lakes during periods of heavy precipitation. These clays are interbedded with lenses of coarser water-bearing material as thick as 20 feet; in contrast, the clay beds are as thick as 400 feet. The lake deposits form a zone of low permeability between the permeable alluvium of the upper aquifer and that of the lower aquifer, although leakage between the two aquifers may occur (Planert and Williams 1995). The upper aquifer, which is the primary source of groundwater for the valley, is generally unconfined whereas the lower aquifer is generally confined. Specific yield of these deposits ranges from 1 to 30 percent (KJC 1995), and wells typically have a moderate to high ability for water well production.

Restrictive Structures

The Antelope Valley Groundwater Basin is composed of three large sediment-filled structural basins separated by extensively faulted, elevated

ATTACHMENT B – Water Service Agreement between the District and AVEK

**WATER SERVICE AGREEMENT
BETWEEN
ANTELOPE VALLEY-EAST KERN WATER AGENCY
AND**

LOS ANGELES COUNTY WATERWORKS DISTRICTS NOS.

4 AND 34

FOR WATER SERVICE

DATED JUL 17 1970

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WATER SERVICE AGREEMENT

THIS AGREEMENT, made and entered into this ____ day of ____ 19__, by and between the Antelope Valley-East Kern Water Agency, established by Chapter 2146 of the 1959 Statutes of the State of California, hereinafter referred to as the "Agency" and Los Angeles County Waterworks Districts Nos. 4 and 34, hereinafter referred to as the "Consumer;"

W I T N E S S E T H :

★ WHEREAS, water is needed within the Agency to supplement existing water supplies and for new areas requiring water supplies; and

★ WHEREAS, groundwater supplies within the Agency are seriously depleted; and

WHEREAS, the Agency and the State of California entered into an agreement entitled "Water Supply Contract Between the State of California, Department of Water Resources, and Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964; Amendment No. 2, dated August 24, 1965; Amendment No. 3, dated February 16, 1967; and Amendment No. 4, dated May 11, 1967, whereby the State of California will furnish a water supply to the Agency; and

WHEREAS, the Agency desires to make available under terms and conditions which, as far as practicable and consistent with the ultimate use of water made available pursuant to said Contract and Amendments, shall be fair and equitable; and

WHEREAS, the inhabitants and lands of the Consumer are in need of additional water for beneficial uses; and

WHEREAS, the Consumer desires to contract with the Agency for a water supply to be for the use and benefit of the Consumer, and for which Consumer will make payment to the Agency upon the terms and conditions hereinafter set forth:

NOW, THEREFORE, IT IS HEREBY MUTUALLY AGREED by and between the parties hereto as follows:

Article 1. Definitions

When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

(a) "Agency" as used herein shall mean Antelope Valley-East Kern Water Agency.

(b) "Consumer" as used herein shall mean any public body, including the United States of America and the State of California, and any of their agencies and departments empowered to contract, counties, cities, districts, local agencies or political subdivisions of the State of California; corporations, public utility water companies, mutual water companies or persons; or any other entity or individual able to and which does execute a Water Service Agreement with the Agency for a water supply; but shall not include any party with whom the Agency may contract to deliver water for a term of years and under special provisions which require the joint use of facilities for the particular benefit of said party and the Agency.

(c) "Agreement" as used herein shall mean this agreement for water service between Agency and Consumer.

(d) "Master Contract" shall mean the contract entitled "Water Supply Contract between the State of California Department of Water Resources and the Antelope Valley-East Kern Water Agency," dated September 20, 1962, as amended by Amendment No. 1, dated September 22, 1964, Amendment No. 2, dated August 24, 1965, Amendment No. 3, dated February 16, 1967, and Amendment No. 4, dated May 11, 1967, and any revisions, amendments or supplements thereto hereafter made.

(e) "Agency Law" shall mean the Antelope Valley-East Kern Water Agency Law, Chapter 2146, Statutes of 1959 of the State of California, as

amended and as the same may be hereafter amended, supplemented, re-enacted, or codified.

(f) "Project Water" shall mean water made available to the Agency by the State of California pursuant to the terms of the Master Contract.

(g) "Treatment and Distribution System" means all fixed installations owned and operated by the Agency having the purpose of treatment, conveyance, control, measurement, spreading and delivery of water.

(h) "Rules and Regulations" means the Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency, as they may be amended and supplemented from time to time by the Board of Directors of the Agency. The Rules and Regulations set forth the conditions under which water will be distributed to the Consumer.

(i) "Year" means the same as the term "Year" means in the Master Contract.

Article 2. Term of Agreement

This Agreement shall become effective on the date first above written and shall remain in effect during the period necessary to repay any bonds designed to finance the Agency's water system.

Article 3. Relationship to Master Contract, and Application of Agency Law

(a) Consumer acknowledges having read the Master Contract and having general familiarity with its terms and that Agency's ability to supply water is governed by said Master Contract and any subsequent modification and supplements thereof.

(b) Consumer also agrees that this Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

Article 3a. Water Rights

Because it may be necessary that consumer maintain and operate his own wells to provide for his own system peak demands and as an emergency reserve water supply, it is advisable that consumer retain and protect his rights to groundwater.

In the event there is an adjudication of the groundwater basin or any of its sub-units, the Agency will assist the Consumers, if the latter so desire, in retaining their rights in the groundwater supply.

Those Consumers who wish the assistance of the Agency, in the event there is an adjudication of the groundwater basin or any of its sub-units, shall submit evidence of the amount of water pumped from each individual well during at least the preceding five-year period and longer if the information is available. This information may be submitted to the Agency at the time of execution of this Agreement or to the State Water Resources Control Board. The Consumer shall also keep continuous records of the amount of water pumped from each individual well for each year following execution of this Agreement. Each year the Consumer may file this information in writing with the Agency, or with the State Water Resources Control Board.

Agency agrees that in the event of such an adjudication as is mentioned in this Article, the evidence of groundwater use of the basin by the Consumers as may have been filed with the Agency will be presented to the Court or other reviewing officer in aid of the Consumers' retention of their rights in the groundwater supply.

This section is not intended in any way to relieve Consumer of any rights or responsibilities it may have under the Recordation Act of 1955 (Water Code, Sec. 4999, et seq.).

Article 4. Delivery of Water

Agency will deliver water to Consumer through the Agency's treatment and distribution system at water service connections. Water delivered pursuant to this Agreement will be delivered to Consumer in accordance with the conditions and procedures set forth in the Rules and Regulations. Consumer shall make application for water delivery turn-ons and shut-offs in accordance with the procedures set forth in the Rules and Regulations. Consumer agrees to be bound by such Rules and Regulations insofar as the same pertain to the subject matter of this Agreement and by any subsequent amendments or supplements thereof that may be adopted by the Board of Directors of the Agency hereafter from time to time. Agency agrees that amendments or supplements to said Rules and Regulations shall not be made without providing Consumer at least 45 days prior written notice of each such proposed amendment or supplement and of the meeting of the Board at which such amendment or supplement is to be acted upon by said Board.

Despite the foregoing provisions and other terms and conditions contained in other Articles of this Agreement, it is understood and acknowledged that Agency's obligations to deliver water pursuant to this Agreement is conditioned upon its being able to provide a water distribution system with which Consumer can be served and that if Agency is unable to provide such a water system, neither it nor its officers, directors or agents shall have any liability to provide water to Consumer nor be subject to any claims, demands or causes of actions on such account.

Article 5. Water Service Connection(s)

Consumer shall make application to Agency for water service connections through which all or a portion of the water to be delivered pursuant to this Agreement shall be delivered to Consumer. Consumer agrees to pay any and all costs incurred by Agency for the design, construction, inspection, operation and maintenance of water service connection(s) serving Consumer. Application and payment for water service connections shall be in accordance with the procedures set forth in the Rules and Regulations. After the same have been constructed, Agency shall own the water service connections and all appurtenances and facilities a part thereof and related thereto. The water service connection, appurtenances and facilities do not include any portion of consumer's water delivery system designed, constructed, acquired or otherwise owned, operated and maintained by Consumer.


Article 6. Water Delivery Schedules

On or before August 1 of each year, Consumer shall submit in writing to the Agency its requested water deliveries by month from each water service connection for the succeeding five years. All requests shall be submitted in the manner set forth in the Rules and Regulations. All water orders, emergency turnoff, and any other request by Consumer which may alter the requested water delivery schedule shall be reported to Agency so that Agency can revise its delivery schedule with the State pursuant to the Master Contract. Because of the fact that the Agency anticipates being in a position to first deliver water in 1972, a Schedule 1 is attached hereto and hereby made a part hereof by reference whereby Consumer indicates its requested water deliveries by month from each water service connection for the succeeding five-year period, such requests, if this contract is dated before 1972, being shown as zero for each of the months involved prior to 1972. If the contract is entered into after the Agency is in a position to deliver water then the requested water deliveries will reflect Consumer's anticipated water requirements for the entire five-year period. Consumer agrees to take from the Agency when the latter is in a position to deliver water to Consumer, the water requested for the first year of service, and the Agency agrees to deliver such water to the Consumer, subject to the other provisions contained in this Agreement and to the Agency's Rules and Regulations.

Article 7. Measurement

All water furnished pursuant to this Agreement shall be measured by the Agency at each water service connection established pursuant to Article 5 hereof with equipment satisfactory to the Agency. Said equipment shall be installed, owned, operated and maintained by the Agency. All determinations relative to the measuring of water shall be made by the Agency and upon request by the Consumer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in the Rules and Regulations. Any error appearing therein will be adjusted pursuant to conditions set forth in the Rules and Regulations. The Agency will install, or cause to be installed, backflow prevention devices in connection with such measuring devices to prevent water delivered to the Consumer or other consumers from returning to the Agency's treatment and distribution system.

Article 8. Limitations on Obligation of Agency to Furnish Water.

 (a) Notwithstanding any provisions of this Agreement to the contrary, the obligation of the Agency to furnish water hereunder shall be limited to the times and to the extent that water and facilities necessary for furnishing the same are available to the Agency pursuant to the Master Contract with the State of California.

(b) The Agency shall not be liable for the failure to perform any portion of this Agreement to the extent that such failure is caused by the failure of the State of California to perform any obligation imposed on the State of California by the Master Contract; provided, however, that the Agency shall diligently and promptly pursue all rights and remedies available to it to enforce the rights of the Agency, the Consumer and other consumers against the State of California under the Master Contract relative to such failure to perform.

Article 9. Water Shortages

(a) No Liability for Shortages.

Neither the Agency, nor any of its officers, agents or employees, shall be liable for any damage, direct or indirect, arising from any shortages which may occur from time to time in the amount of water to be made available for delivery to the Consumer pursuant to the Master Contract or any other cause beyond the control of the Agency.

(b) Allocation of Water in Times of Shortage.

The Agency reserves the right in the event that at any time the quantity of water available to the Agency pursuant to the Master Contract is less than the aggregate of the requests of all consumers to allocate the quantity of water available to the Agency to the extent permitted by law.

Article 10. Curtailment of Delivery for Maintenance Purposes

The Agency may temporarily discontinue or reduce the amount of water to be furnished to the Consumer for purposes of maintaining, repairing, replacing and investigating or inspecting, any of the facilities necessary for the furnishing of such water to the Consumer. Insofar as it is feasible the Agency will give the Consumer due notice in advance of any such temporary discontinuance or reduction, except in the case of emergency, in which case no notice need be given. In the event of such discontinuance or reduction, the Agency will make available upon resumption of service, as nearly as may be feasible, and to the extent water is available to it, the quantity of water which would have been available to the Consumer in the absence of such discontinuance or reduction.

**Article 11. Responsibilities for Delivery and Distribution of
Water Beyond Water Service Connection(s)**

After such water has passed the Water Service Connection(s) established in accordance with Article 5, neither the Agency nor its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water supplied to the Consumer or for claim of damages of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, distribution or changes occurring in the quality of such water beyond said Water Service Connection; and the Consumer shall indemnify and hold harmless the Agency and its officers, agents, and employees from any such damages or claims of damages, and including reasonable attorneys' fees incurred as against the unsuccessful party in defending against any claims or actions for damages on such account.

Article 12. Water Quality

X
The quality of water delivered by the Agency to the Consumer pursuant to this Agreement shall depend upon the quality of the water furnished to the Agency under the Master Contract, except as the same may be modified by the Agency's local treatment of water. The Agency undertakes no responsibility to Consumer to furnish water pursuant to this Agreement of any particular quality except as may result from the above-mentioned source of supply and any treatment provided by the Agency.

Article 13. Payments

Payment of all charges shall be made at the rates, times and in the manner provided for in the "Rules and Regulations for Distribution of Water, Antelope Valley-East Kern Water Agency," as the same may be amended and supplemented from time to time by the Board of Directors of the Agency. On or before July 1st of each year, the Agency shall adopt by resolution of the Board of Directors the water rate in dollars per acre-foot which will be charged for water to be delivered in the next succeeding year. At this time, the Agency shall make available to the Consumers the estimated water rates in dollars per acre-foot to be charged for water to be delivered in the second and third succeeding years.

Article 14. Excess Lands

The provisions of Article 30 of the Master contract to the extent applicable shall be binding upon Consumer, and Consumer agrees to obtain and furnish to the Agency such certifications and information as are required to be furnished by the Agency to the State of California by said Article 30.

Article 18. Default

In the event of default by the Consumer in payment to the Agency of any money required to be paid hereunder and pursuant to the Rules and Regulations, the Agency may in its discretion, and in accordance with the Rules and Regulations, suspend delivery of water to the Consumer during the period that the latter is delinquent in its payments.

Article 16. Interest on Overdue Payments.

Upon each charge to be paid by the Consumer to the Agency pursuant to this Agreement which shall remain unpaid after the same shall have become due and payable, interest shall accrue at the rate of one-half of one percent (1/2%) per month of the amount of such delinquent payment from and after the date when the same becomes due until paid, and the Consumer hereby agrees to pay such interest. In no event shall such interest be compounded.

Article 17. Changes in Organization of Consumer

The Consumer will furnish the Agency with maps showing the territorial limits of the Consumer and the service area or areas of its water distribution system. Throughout the term of this Agreement, the Consumer will promptly notify the Agency of any changes, either by inclusion or exclusion, in said territorial limits and service area or areas. Consumer agrees to conform to the requirement of Article 15(a) of the Master Contract that any water wholly or partly delivered by the Agency to Consumer will not be delivered outside of the territorial boundaries of the Agency without written consent having first been obtained.

Article 18. Remedies Not Exclusive

Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

Article 19. Amendments

This Agreement may be amended or supplemented at any time by mutual written agreement of the parties in any manner that may be consistent with the applicable law. In amending or supplementing this Agreement, however, the Agency will bear in mind that substantial uniformity of Agreements between the various Consumers of the Agency is thought to be desirable as to the main contracting concepts and principles that are to be used and therefore will attempt to maintain uniformity between the various Consumers' Agreements in such respects.

Article 20. Opinions and Determinations

Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

Article 21. Waiver of Rights

Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default or matter.

Article 22. Notices

All notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Consumer by such officers and persons as they may, from time to time, authorize in writing to so act. All such notices shall be deemed to have been given and delivered if delivered personally or if enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail. Unless and until formally notified otherwise, all notices shall be addressed to the parties at their addresses as shown on the signature page of this Agreement.

Article 23. Assignment

The provisions of this Agreement shall apply to and bind the successors and assigns of the respective parties, but no assignment or transfer of this Agreement, nor any part hereof nor interest herein by the Consumer shall be valid until and unless approved by the Agency, except an assignment to an affiliate of the Consumer, or to a party or parties, which by merger, consolidation, dissolution, purchase or otherwise, shall succeed to substantially all of the assets and business of the Consumer. Affiliate, as used herein, shall mean a corporation that directly or indirectly, through one or more intermediaries, controls, or is controlled by, or is under common control with, the assigning party.

Article 24. Inspection of Books and Records

The proper officers or agents of the Consumer shall have full and free access at all reasonable times to the account books and official records of the Agency insofar as the same pertain to the matters and things provided for in this Agreement, with the right at any time during office hours to make copies thereof at the Consumer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights in respect to the account books and records of the Consumer.

Article 25. Validation

At any time after the execution of this Agreement, either party may if it so desires submit this Agreement to a Court of competent jurisdiction for a determination of its validity, and whichever party elects to follow such a procedure the other party agrees to cooperate therein to any extent that may be necessary or advisable and that shall be requested by the plaintiff. The plaintiff shall bear the costs and attorneys' fees incurred in such a proceeding.

Article 26. Uniformity of Provisions

It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the various Consumers entering into this Agreement with the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into that will substantially affect the interests of Agency's Consumers generally in the Agency's opinion shall as provided in Article 19 hereof be made available to all Consumers entering into this Agreement with the Agency on an equal basis.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date first above written.

Approved as to Form and Sufficiency

By: [Signature]
Attorney for Agency

ATTEST:

BY: [Signature]
Secretary
Antelope Valley-East
Kern Water Agency

ANTELOPE VALLEY-EAST KERN
WATER AGENCY
554 West Lancaster Boulevard
Lancaster, California 93534
(805) 942-8439

By: [Signature]
President

DISTRICTS:

LOS ANGELES COUNTY WATERWORKS
DISTRICTS NOS. 4 AND 34

(SEAL)

ERNEST E. DEBS

Chairman of the Board of
Supervisors of the County of
Los Angeles, State of
California, as the governing
body of said Districts.

Approved as to Form:

John D. Maharg, County Counsel

By: [Signature]
Deputy

JUL 17 1970

Date Executed

(SEAL)

Attest:

James S. Mize, Executive
Officer-Clerk of the Board
of Supervisors of the County
of Los Angeles

By: FRANCES L. HUSBY
Deputy

ADOPTED
BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES

50

JUL 14 1970

31

[Signature]
JAMES S. MIZE
EXECUTIVE OFFICER

ATTACHMENT C – Water Supply Tables for the District during normal, single- and multiple-dry years

discussed above) of AVEK's Table A Amount available to the Study Area. Demand estimates are based on the per capita projections developed in Section 4. Conservation was determined assuming a 2.0 percent reduction per five-year interval for a maximum reduction of 10 percent in 2030.

As shown by the comparison, all of the water purveyors will have sufficient supply to the increasing demand through 2030 with the implementation of the planned water supplies, assuming the availability of groundwater remains the same. Again, the table reflects the water purveyors' practice of conserving groundwater for additional availability in dry water years.

**TABLE 3-4
AVERAGE WATER YEAR ASSESSMENT**

	2010	2015	2020	2025	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR ^(a)	0	0	0	0	0
Imported Water	69,800	70,400	70,000	68,600	64,500
Total Existing Supply	89,800	90,400	90,000	88,600	84,500
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	16,400	3,300	(9,900)	(22,500)	(36,600)
Difference as Percent of Supply	18	4	(11)	(25)	(43)
Difference as Percent of Demand	22	4	(10)	(20)	(30)
Planned Water Supplies					
New Supply	0	0	2,000	11,600	23,100
Recycled Water	2,700	5,400	8,200	10,900	13,600
Total Planned Supply	2,700	5,400	10,200	22,500	36,700
Total Existing and Planned Supplies	92,500	95,800	100,200	111,100	121,200
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	19,100	8,700	300	0	100
Difference as Percent of Supply	21	9	0	0	0
Difference as Percent of Demand	26	10	0	0	0

**TABLE 3-5
SINGLE DRY WATER YEAR ASSESSMENT**

	2010	2015	2020	2025	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	31,600	31,600
Imported Water	6,900	6,800	6,500	6,300	5,900
Total Existing Supply	58,500	58,400	58,100	57,900	57,500
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	(14,900)	(28,700)	(41,800)	(53,200)	(63,600)
Difference as Percent of Supply	(25)	(49)	(72)	(92)	(111)
Difference as Percent of Demand	(20)	(33)	(42)	(48)	(53)
Planned Water Supplies					
Groundwater Banking/New Supplies	12,300	23,400	33,700	42,400	50,100
Recycled Water	2,700	5,400	8,200	10,900	13,600
Total Planned Supply	15,000	28,800	41,900	53,300	63,700
Total Existing and Planned Supplies	73,500	87,200	100,000	111,200	121,200
District 40 Demand (w/out conservation)	74,900	90,700	106,300	120,800	134,600
Conservation	1,500	3,600	6,400	9,700	13,500
Demand (w/conservation)	73,400	87,100	99,900	111,100	121,100
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-6
MULTI DRY WATER YEAR ASSESSMENT 2006-2010**

	2006	2007	2008	2009	2010
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	0	0	0	0	0
Imported Water	17,800	17,800	17,800	17,700	17,700
Total Existing Supply	37,800	37,800	37,800	37,700	37,700
District 40 Demand (w/out conservation)	61,800	65,000	68,300	71,600	74,900
Conservation	200	500	800	1,100	1,500
Demand (w/conservation)	61,600	64,500	67,500	70,500	73,400
Difference (supply minus demand)	(23,800)	(26,700)	(29,700)	(32,800)	(35,700)
Difference as Percent of Supply	(63)	(71)	(79)	(87)	(95)
Difference as Percent of Demand	(39)	(41)	(44)	(47)	(49)
Planned Water Supplies					
Groundwater Banking/New Supplies	23,400	25,700	28,200	30,700	33,100
Recycled Water	500	1100	1600	2200	2700
Total Planned Supply	23,900	26,800	29,800	32,900	35,800
Total Existing and Planned Supplies	61,700	64,600	67,600	70,600	73,500
District 40 Demand (w/out conservation)	61,800	65,000	68,300	71,600	74,900
Conservation	200	500	800	1,100	1,500
Demand (w/conservation)	61,600	64,500	67,500	70,500	73,400
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-7
MULTI DRY WATER YEAR ASSESSMENT 2011-2015**

	2011	2012	2013	2014	2015
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	100	0	0	0
Imported Water	17,600	17,500	17,500	17,400	17,300
Total Existing Supply	69,200	37,600	37,500	37,400	37,300
District 40 Demand (w/out conservation)	78,100	81,200	84,400	87,600	90,700
Conservation	1,900	2,300	2,700	3,200	6,300
Demand (w/conservation)	76,200	78,900	81,700	84,400	84,400
Difference (supply minus demand)	(7,000)	(41,300)	(44,200)	(47,000)	(47,100)
Difference as Percent of Supply	(10)	(110)	(118)	(126)	(126)
Difference as Percent of Demand	(9)	(52)	(54)	(56)	(56)
Planned Water Supplies					
Groundwater Banking/New Supplies	3,800	37,600	39,900	42,200	41,800
Recycled Water	3,300	3,800	4,400	4,900	5,400
Total Planned Supply	7,100	41,400	44,300	47,100	47,200
Total Existing and Planned Supplies	76,300	79,000	81,800	84,500	84,500
District 40 Demand (w/out conservation)	78,100	81,200	84,400	87,600	90,700
Conservation	1,900	2,300	2,700	3,200	6,300
Demand (w/conservation)	76,200	78,900	81,700	84,400	84,400
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-8
MULTI DRY WATER YEAR ASSESSMENT 2016-2020**

	2016	2017	2018	2019	2020
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	100	0	0
Imported Water	17,200	17,100	17,000	16,900	16,800
Total Existing Supply	68,800	68,700	37,100	36,900	36,800
District 40 Demand (w/out conservation)	94,000	97,000	100,000	103,200	106,300
Conservation	4,100	4,700	5,200	5,800	6,400
Demand (w/conservation)	89,900	92,300	94,800	97,400	99,900
Difference (supply minus demand)	(21,100)	(23,600)	(57,700)	(60,500)	(63,100)
Difference as Percent of Supply	(31)	(34)	(156)	(164)	(171)
Difference as Percent of Demand	(23)	(26)	(61)	(62)	(63)
Planned Water Supplies					
Groundwater Banking/New Supplies	15,200	17,200	50,700	53,000	55,000
Recycled Water	6,000	6,500	7,100	7,600	8,200
Total Planned Supply	21,200	23,700	57,800	60,600	63,200
Total Existing and Planned Supplies	90,000	92,400	94,900	97,500	100,000
District 40 Demand (w/out conservation)	94,000	97,000	100,000	103,200	106,300
Conservation	4,100	4,700	5,200	5,800	6,400
Demand (w/conservation)	89,900	92,300	94,800	97,400	99,900
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-9
MULTI DRY WATER YEAR ASSESSMENT 2021-2025**

	2021	2022	2023	2024	2025
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	200	0
Imported Water	16,600	16,500	16,300	16,200	16,000
Total Existing Supply	68,200	68,100	67,900	36,400	36,000
District 40 Demand (w/out conservation)	109,200	112,100	115,000	117,900	120,800
Conservation	7,000	7,600	8,300	9,000	9,600
Demand (w/conservation)	102,200	104,500	106,700	108,900	111,200
Difference (supply minus demand)	(34,000)	(36,400)	(38,800)	(72,500)	(75,200)
Difference as Percent of Supply	(50)	(53)	(57)	(199)	(209)
Difference as Percent of Demand	(33)	(35)	(36)	(67)	(68)
Planned Water Supplies					
Groundwater Banking/New Supplies	25,400	27,300	29,100	62,300	64,400
Recycled Water	8,700	9,200	9,800	10,300	10,900
Total Planned Supply	34,100	36,500	38,900	72,600	75,300
Total Existing and Planned Supplies	102,300	104,600	106,800	109,000	111,300
District 40 Demand (w/out conservation)	109,200	112,100	115,000	117,900	120,800
Conservation	7,000	7,600	8,300	9,000	9,600
Demand (w/conservation)	102,200	104,500	106,700	108,900	111,200
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

**TABLE 3-10
MULTI DRY WATER YEAR ASSESSMENT 2026-2030**

	2026	2027	2028	2029	2030
<i>District 40</i>					
Existing Water Supplies					
Groundwater	20,000	20,000	20,000	20,000	20,000
ASR	31,600	31,600	31,600	31,600	300
Imported Water	15,800	15,600	15,400	15,200	15,100
Total Existing Supply	67,400	67,200	67,000	66,800	35,400
District 40 Demand (w/out conservation)	123,500	126,300	129,000	131,800	134,600
Conservation	10,400	11,100	11,900	12,700	13,500
Demand (w/conservation)	113,100	115,200	117,100	119,100	121,100
Difference (supply minus demand)	(45,700)	(48,000)	(50,100)	(52,300)	(85,700)
Difference as Percent of Supply	(68)	(71)	(75)	(78)	(242)
Difference as Percent of Demand	(40)	(42)	(43)	(44)	(71)
Planned Water Supplies					
Groundwater Banking/New Supplies	34,400	46,900	37,700	39,300	72,200
Recycled Water	11,400	1,200	12,500	13,100	13,600
Total Planned Supply	45,800	48,100	50,200	52,400	85,800
Total Existing and Planned Supplies	113,200	115,300	117,200	119,200	121,200
District 40 Demand (w/out conservation)	123,500	126,300	129,000	131,800	134,600
Conservation	10,400	11,100	11,900	12,700	13,500
Demand (w/conservation)	113,100	115,200	117,100	119,100	121,100
Difference (supply minus demand)	100	100	100	100	100
Difference as Percent of Supply	0	0	0	0	0
Difference as Percent of Demand	0	0	0	0	0

LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40REQUIRED WATER SUPPLY ASSESSMENT (WSA) (SB 610)
Water Code §10910 *et seq.***Notice of Determination**

Lead Agency

Applicant's Name and Address

City of Lancaster
Community Development
44933 North Fern Avenue
Lancaster, CA 93534same

_____**Project Information** (Check all that apply)Project Title: Tentative Tracts 60610 & 60620

- ☒ Residential: No of dwelling units: 820
- ☐ Shopping center or business: _____ employees and _____ ft² of floor space
- ☐ Commercial office: _____ employees and _____ ft² of floor space
- ☐ Hotel or motel: No. of rooms _____
- ☐ Industrial, manufacturing, or processing: _____ acres, _____ employees, and _____ ft² of floor space.
- ☐ Mixed use (check and complete all above that apply)
- ☐ Other: _____
- ☐ Number of existing service connections 0

Is this a project as defined by Water Code § 10912 Yes / No**Water Supply Assessment (WSA)** (see supporting documents)Date when request for water supply assessment was received August 15, 2006

- ☒ The projected water demand for the project was included in Los Angeles County Waterworks District No. 40 most recently adopted Urban Water Management Plan dated December, 2000
- ☒ A sufficient water supply is available for the project. The total water supplies available to Los Angeles County Waterworks District No. 40 during normal, single-dry, and multiple-dry years with a 20-year projection will meet the projected water demand of the project in addition to the demand of existing and other planned future uses, including, but not limited to, agricultural and manufacturing uses.
- ☒ A portion of the required water supply will be provided by projected water supplies.
- ☐ A sufficient water supply is not available for the Project. [Plan for acquiring and developing sufficient water supply attached. Water Code § 10911(a)]

The foregoing determination is based on the following Water Supply Assessment Information and supporting information in the records of Los Angeles County Waterworks District No. 40.

Signature

Title

Date

LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40

REQUIRED WATER SUPPLY ASSESSMENT (WSA) (SB 610)
Water Code §10910 *et seq.*

Notice of Determination

Lead Agency

Applicant's Name and Address

City of Lancaster
Community Development
44933 North Fern Avenue
Lancaster, CA 93534

same

Project Information (Check all that apply)

Project Title: Tentative Tracts 62758 and 62759

- ☒ Residential: No of dwelling units: 739
- ☐ Shopping center or business: _____ employees and _____ ft² of floor space
- ☐ Commercial office: _____ employees and _____ ft² of floor space
- ☐ Hotel or motel: No. of rooms _____
- ☐ Industrial, manufacturing, or processing: _____ acres, _____ employees, and _____ ft² of floor space.
- ☐ Mixed use (check and complete all above that apply)
- ☐ Other: _____
- ☐ Number of existing service connections 0

Is this a project as defined by Water Code § 10912 Yes / No

Water Supply Assessment (WSA) (see supporting documents)

Date when request for water supply assessment was received August 15, 2006

- ☒ The projected water demand for the project was included in Los Angeles County Waterworks District No. 40 most recently adopted Urban Water Management Plan dated December, 2000
- ☒ A sufficient water supply is available for the project. The total water supplies available to Los Angeles County Waterworks District No. 40 during normal, single-dry, and multiple-dry years with a 20-year projection will meet the projected water demand of the project in addition to the demand of existing and other planned future uses, including, but not limited to, agricultural and manufacturing uses.
- ☒ A portion of the required water supply will be provided by projected water supplies.
- ☐ A sufficient water supply is not available for the Project. [Plan for acquiring and developing sufficient water supply attached. Water Code § 10911(a)]

The foregoing determination is based on the following Water Supply Assessment Information and supporting information in the records of Los Angeles County Waterworks District No. 40.

Signature

Title

Date